REPORT RESUMES

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NDEA TITLE XI INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS (SAN JOSE STATE COLLEGE, JUNE 19-JULY 28, 1967). FINAL TECHNICAL REPORT.

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THE INSTITUTE WAS HELD TO IMPROVE INSTRUCTION AND UPDATE CURRICULUM OFFERINGS THROUGH THE DEVELOPMENT OF NEW INSTRUCTIONAL MATERIALS AND PROCEDURES WHEREBY INDUSTRIAL MATERIALS MAY BE INTEGRATED INTO THE LABORATORY ACTIVITIES OF INDUSTRIAL ARTS PROGRAMS. THE 24 PARTICIPANTS WERE TEACHER EDUCATORS, SUPERVISORS, AND TEACHERS FROM 16 STATES. PHASE I WAS DEVOTED TO A TECHNOLOGICAL STUDY OF CHEMICAL, PHYSICAL, AND MECHANICAL PROPERTIES OF INDUSTRIAL MATERIALS. DURING PHASE II THE PARTICIPANTS UTILIZED THE TECHNICAL INSTRUCTION OF PHASE I TO DEVELOP 60 UNITS OF INSTRUCTION BASED ON INDUSTRIAL MATERIALS. THE DEVELOPMENT OF THESE UNITS INVOLVED THE BUILDING AND TESTING OF DEMONSTRATION MODELS FOR USE AS INSTRUCTIONAL MEDIA. A DAY-BY-DAY DESCRIPTION OF THE INSTITUTE PROGRAM, AN EVALUATION REPORT AND DETAILS OF THE ADMINISTRATION OF THE INSTITUTE ARE INCLUDED. (EM)

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FINAL TECHNICAL REPORT
ON THE

NDEA TITLE XI INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS

CONTRACT NUMBER
OEC-4-7-750397-2105

SAN JOSE STATE COLLEGE
June 19 - July 28, 1967

Submitted by: Ralph C. Bohn
RALPH C. BOHN
DIRECTOR

TABLE OF CONTENTS

Title . . . . . Page

INTRODUCTION 1

SPECIAL REPORT 3

EVALUATION - PREPLANNING 6

Relations with USOE 6

Relations with College Administration 6

Pre-Institute Preparation 7

Preparation and Distribution of Brochure 7

Collection and Cataloging of Applications 8

Selection of Participants 9

Communications with Participants in Preparation for Their Attendance 12

Preplanning of the Instructional Program 13

Orientation of Participants 13

Physical Facilities 14

EVALUATION - SUMMER PROGRAM 15

Day-By-Day Schedule Course Content 16

Instructional Materials Planned and Developed 44

Field Trips, Industrial Demonstrations, Guest Speakers. 45

Institute Staff 46

EVALUATION - CONTENT AND STUDENT EVALUATION REPORTS 48

Content Examination 48

Participant Evaluation of Institute 50

Director and Faculty Evaluation of Institute 54

Objectives 54

Optimum Number of Grade Levels Included 54

Beginning Dates 55

Title Page

Participants - Number and Selection 55

Time, Ratio of Staff to Participants, Budget . . 55

APPENDICES

Appendix A - Copy of Institute Brochure 57

Appendix B - Copy of Letter Accompanying the Application Packet 62

Appendix C - Copy of Application For Admission 63

Appendix D - Copy of Letter sent to each Applicant who didn't have his application completed by one week prior to the deadline 64

Appendix E - Copy of Identification Slip attached to each Application to aid Identification . 65

Appendix F - Copy of Letter to the Applicants Selected to attend the Institute 66

Appendix G - Copy of Letter to Applicants Selected as Alternates 67

Appendix H - Copy of Letter to Applicants Not Accepted 68

Appendix I - List of Participants, Their Teaching Areas, Home Addresses, and School Addresses . . 69

Appendix J - Copy of Follow-up Letter to Alternates Prior to Start of the Summer Session 71

Appendix K - Copy of Housing Letter Sent to All Participants 72

Appendix L - Copy of Stipend and General Information Letters Sent to All Participants 75

Appendix M - Copy of Question and Answer Report Sent to All Participants 78

Appendix N - Typical Unit prepared during the Institute. 84

Appendix O - Copy of Participant Evaluation Form . . . 87

Appendix P - Statistical Tables Developed and Furnished by the Measurement Research Center of Iowa 90

Appendix Q - Header Card submitted to Measurement Research Center of Iowa 91

LIST OF TABLES

Title Page

TABLE 1 - Distribution of Participants by States 11

TABLE 2 - Before and After Test Scores 49

INTRODUCTION

The final report is supposed to mark the ending of the program. Yet, if the Institute has been a success, this report should only mark the termination of formal instruction and should introduce a period of instructional improvement in the industrial materials phase of industrial arts.

This Institute was developed to fulfill the following selected NDEA Title XI objectives, as interpreted by the Director. These include:

1. Improvement of instruction and updating of the curricular offerings of teachers in attendance.

2. Development of new instructional materials which, provide improved instruction and contribute to the available knowledge. In this case, the Institute concentrated on developing procedures whereby industrial materials can be integrated into the laboratory activities of on going industrial arts programs.

3. Provide for impact in different areas of the country through the selection of leadership and potential leadership personnel. This should produce wider dissemination of the knowledge developed and learned at the Institute.

This report has been prepared in lithograph to permit its distribution to the teachers in attendance, the faculty, appropriate college officials, and others requesting information on the Institute. The format described in the Handbook for Directors was followed. However, a few modifications were made to the suggested method of presentation. These include:

1. The manual indicates that the main body of the report be identified under the classification of Evaluation. Also, the report should be evaluative rather than descriptive. Every effort was made to comply with this request. However, it was not possible to be evaluative of activities that were not described, without making an erroneous assumption that the reader had prior knowledge of the total institute program. While this assumption might be appropriate for USOE personnel and teachers in attendance, it is not appropriate for college officials and their interested people. As a result, both descriptive and evaluative information was included in this section. The descriptive material was included so that the report may be used by others in gaining and understanding of the program, as well as reviewing the evaluation.

2. The evaluation section was divided into three distinct categories. These include:

    a. Evaluation - Preplanning

    b. Evaluation - Summer Program

    c. Evaluation - Content and Student Evaluation Reports

Besides this report, the institute produced a group of teaching experiments which are appropriate for secondary school uses. These experiments were planned and designed by the teachers in attendance, and whenever appropriate, teaching aids were manufactured for use with the experiment. This was done to make certain that the experiment was feasible and appropriate for secondary school industrial arts, as well as gaining information on the nature of the data received. These experiments have been compiled into a single report so that each teacher in attendance could profit from the efforts of the others. A number of additional copies of the report were made to permit some dissemination throughout the profession.

SPECIAL REPORT

In the estimation of the director and instructional staff, the Institute accomplished the planned objectives. The teachers, supervisors, and teacher educators in attendance gained considerable knowledge about industrial materials, and the study of industrial materials as an integrated part of industrial arts. More specifically, accomplishments included:

1. Increased technical knowledge - Each participant demonstrated a significant increase in knowledge regarding the structure, properties, and industrial use of industrial materials. This knowledge was measured by a before and after objective examination, and by the subjective evaluation of the staff. The examination used had been used by the department on other occasions to measure technical knowledge of industrial materials. The institute participants scored significantly higher than previous groups.

2. Developed knowledge and techniques for teaching industrial materials - Considerable progress was made by the participants in developing teaching devices and techniques usuable in junior and senior high school industrial arts. Basically, the present methods used to teach industrial materials involve teacher presentations (lecture-discussion - visual aids) and minimum student participation. The participants developed numerous experimental devices and planned instructional units using the experiment, thereby providing for student activities. These activities will permit industrial materials to be taught at a lower levelof abstraction, increasing student interest and learning.

3. Impact and dissemination of information - Participants represented many different parts of the country, thereby taking the knowledge back to their own districts. In addition, many of the participants are or have the potential to be leaders of their profession.

Based on the evaluation of the Institute, a number of changes are planned for future Institutes or programs of this type, should the opportunity to repeat be provided.

1. Lighten the schedule by providing at least one afternoon per week for planned activities unrelated to the Institute. These might include cultural tours and visits, recreation, local travel and school visitations. These activities would be planned to take advantage of the local area, and break the strenuous pace of the program.

2. Recognize, more clearly, the strain produced by the continual pressure of studying difficult concepts and planning ways in which these concepts can be taught to secondary school students. The above items would help relieve some of the unnecessary strain.

3. Grouping of participants by subject area (metals, wood, etc.) would not be repeated. Instead all participants would study materials in a more generic manner, working on instructional units of direct interest and use in their teaching situation.

4. The involvement of teacher educators and supervisors with classroom teachers proved effective for the total class. They were, however, grouped so that a teacher educator and/or supervisor was on each group. This did not contribute to the Institute and, in some instances, proved to be a minor disadvantage. Future groupings for curriculum development will be based solely on interest.

5. The heavy concentration of instruction during the first week was not as effective as originally anticipated. This concentration was a departure from the normal procedure of establishing a realistic rate of lecture and demonstration and maintaining this level, with minor variations, during the instructional program. The normal procedure would be used in the future, and the problem which the heavy concentration tried to avoid, of beginning on curriculum planning without sufficient knowledge would be restudied for other solutions.

6. The use of additional experts in various phases of industrial materials should be given careful consideration. This consideration is faced with some problems. A number of participants, including the staff, suggested use of additional people. However, the evaluation of the performance of the guest instructors in this areas was not as high as desired. This means that considerable caution should be exercised in the selection of outline demonstrations and guest lecturers.

A total overview of the program, its accomplishments and shortcomings, indicate that the program is worthy of repetition. It was successful in accomplishing its objectives and should be quite effective in improving the instructional programs of those in attendance. Naturally, the knowledge gained from this Institute and its evaluation should be employed in the future.

If a second Institute is approved, it should have three areas of emphasis:

1. Technical knowledge of industrial materials, presented at a normal rate during the total Institute.

2. Curriculum materials designed to continue where the participants of this Institute finished. The group which just finished was far ahead of what was originally anticipated. However, these are instructional units and procedures which are new to the teachers and school, and require the investment of a considerable amount of time and effort.

3. Field testing of instructional units in school situations. The instructional units developed by the participants should be taught in summer school programs to determine whether the unit is effective in secondary schools.

EVALUATION - PREPLANNING

Institute preplanning involved all activities beginning with the preparation of the initial proposal, through contract negotiations, selection of participants, and arrival of participants for the instructional program.

The importance of this period can't be over emphasized. Weaknesses in planning the instructional program, selection of participants, providing appropriate housing, etc., can materially effect the total program. As a result, this phase of the program received considerable attention. Efforts were made to make certain the participants arrived with a knowledge of the program, as well as some indications of problems they might encounter with living and studying at San Jose State College.

Relations with USOE

The USOE was very cooperative and helpful during all phases of program planning and contract negotiations. The Industrial Arts Division, the one with which we had almost exclusive contact, provided all necessary assistance. Questions were answered promptly and every effort was made to assist us in planning the best possible program.

The only negative aspect of this phase of preplanning was one over which USOE had no control. The period of time between the initial meeting of Institute Directors and the deadline for mass mailing of institute brochures was too small. The period of time during which the brochure was developed and printed involved the Christmas holidays--a time when printing companies are extremely busy. As a result, the brochures were planned and written in a hurry, and did not represent the best efforts of the host institution. Appendix A contains a copy of the Institute brochure.

We realize that the appropriation was delayed in Congress, which resulted in the late date for the Directors meeting. This fact, coupled with the need to notifying teachers about available institutes early in the year, permitted only a very limited time to prepare the brochure.

Relations with College Administration

San Jose State College is deeply involved with the inservice education of teachers. The summer session at San Jose State is 12,243 students, approximately 56% of our regular school population. The majority of people in attendance during the summer are elementary and secondary teachers seeking inservice education. As a result, the college has accepted a major responsibility in inservice education and has provided full cooperation and encouragement for conducting NDEA Title XI Institutes.

The services provided by the college are, by necessity, limited to support and fiscal activities. The planning of the program must be conducted by the staff within the department in which the Institute will be held. At San Jose State, both support and fiscal matters were handled in an effective and expeditious manner by the Research and Foundation Offices.

Pre-Institute Preparation

Pre-institute preparation included the preparation and distribution of the brochure, collection and cataloging of applications, selection of participants, communications with participants in preparation for their attendance, and preplanning of the instructional program.

Preparation and Distribution of Brochure - Ten thousand of the brochures were prepared and distributed to the profession. Prior to distribution of the brochure, the American Industrial Arts Association (AIAA) offered to mail copies of all industrial arts institute brochures to their members. Since this membership comprises a broad cross section of industrial arts teachers throughout the United States, this seemed to be an efficient way of informing the profession of the institute. The AIAA agreed to provide this service, divide the cost of the mailing between all institutes participating, and pay part of the cost from the association budget. We provided the necessary brochures which were mailed to all members in January, 1967. In addition, we forwarded individual copies of the brochures to everyone that requested them. Requests were generated by USOE publicity and by the announcements listed in all industrial arts professional journals. The following distribution of brochures was made:

1.	American Industrial Arts Association Membership	6,000
2.	San Jose State College Industrial Arts Department Mailing Lists	800
3.	Individual Requests for Brochures	1,609
	TOTAL:	8,409

When a request for the application packet was received on the tear slip from the back of the brochure, we were able to identify whether the request was generated by the AIAA distribution of brochures, or by the brochures mailed to individuals by their request or by department mailing lists. The following division of application requests was observed:

1.	Application requests generated by AIAA Mailing to their membership	199
2.	Application requests generated by Department mailings or individual requests	364
	TOTAL:	563

We found the cooperation of the AIAA extremely valuable in the dissemination of information on the Institute. The mailing, coupled with the requests resulting from announcements carried in each of the major industrial arts journals and from the USOE listing of Institutes sent to all elementary and secondary schools, provided the broad distribution of information required. As a result of these procedures, we had almost no late requests or complaints from people who indicated they heard about the institute too late to apply.

Collection and Cataloging of Applications - In order to provide for accurate mailing of application information, self-addressed envelopes were included with all application packets. In addition, a letter describing the application procedure in detail was included with each packet. Each packet contained the following items:

1. Letter describing the application procedure (copy included as Appendix B)
2. Application Form (OE 4401)
3. Supplement to Application Form (copy included as Appendix C)
4. Applicant Record Card (OE 4402)
5. Confidential Evaluation Form (OE 4403)
6. Institute Brochure
7. Two return envelopes

As applications were received, they were checked for completeness and all correspondence considered and answered, as appropriate. The total application procedure required individual mailings by the applicant (application blank), school administrator (recommendation), and former colleges or universities (transcripts). A system for cataloging and checking the different parts of the application was established. When all materials were received, the application was stapled to all other materials and placed in file for evaluation.

As the application deadline approached, a letter was sent to each person who had submitted some application materials, but had not completed the process. A copy of this letter is included as Appendix D.

Since the number of ineligible applicants was very small, these people were contacted by personal letter, explaining their problem. Actually, the number of ineligible applicants was less than ten, most being either junior college teachers or teachers not having at least one degree with an industrial arts major.

This phase of the program operated efficiently and without incident. The credit should go to the efficient secretary who maintained all records and was responsible for all correspondence with the applicants.

Selection of Participants - As applications were completed, a simple identification slip was attached and filled out for each applicant (a copy of this slip is included as Appendix E). A total of 251 complete applications were received and considered. Only 8 applications were incomplete and disqualified due to insufficient information.

In order to provide broad impact upon the profession and have each area represented, guidelines for selection of participants were developed. Basically, efforts were made to select from junior high, senior high, industrial arts supervision, and industrial arts teacher education. One person from each of these four categories was sought for each of the following teaching areas:

1. Automotive and Power
2. Drafting
3. Electricity/Electronics
4. General Metals
5. General Woods
6. Graphic Arts

Teachers from general industrial arts programs were used to fill a number of the individual subject area positions. This distribution was ideal and served as a guide for selection of participants. Since some areas had a larger number of positions within the institute.

Selection criteria was based on the published eligibility requirements and consisted of an evaluation of the following requirements:

1. Three years teaching and/or supervisory experience as an industrial arts teacher (grades 7-12), supervisor, or teacher educator.

2. Teaching area of metals, woods, plastics, graphic arts, electronics, auto and power, or general industrial arts (general shop).

3. Bachelor's or Master's degree with a major in industrial arts (verified by college transcript).

4. Contract or agreement to continue, during 1967-68, teaching in grades 7-12, supervision, or teacher education requiring a knowledge of industrial materials.

5. One year of college chemistry, including organic and inorganic chemistry. In some cases, this requirement was met by verified experience or self-study.

6. Written recommendation of immediate supervisors (school principal or superintendent). This recommendation had to show that the participating teacher would be encouraged to use institute experiences.

7. Statement describing interest in industrial materials and its relationship to industrial arts instruction, and interest and reason for participation in the institute.

The evaluation of all applications was conducted by a committee consisting of the director and the two principle staff members (Ralph Bohn, Louie Melo, Leslie Stephenson). Each application was reviewed and rated by each member of the committee. The final selection was based upon the composite rating, and was accomplished by group consideration of all applications rated near the top. Twenty-four applicants and twenty-four alternates were selected. The twenty-four alternates were given positions which paralleled the positions of those selected, and were representative of all seven instructional areas (wood, metals, etc.) and all facets of the profession (teacher, supervisor, etc.).

Following the selection, letters were sent to each applicant identifying his status. The letters to applicants selected included necessary forms needed to authorize payments of the stipends. Appendix F contains a copy of the letter sent to those selected. Appendix G contains a copy of the letter sent to the alternates, and Appendix H, contains a copy of the letter sent to those we were unable to accept.

Twenty-one of the twenty-four selected accepted the invitation and subsequently attended. The other three notified us they would be unable to attend. Three alternates were called and all accepted the invitation and subsequently attended. A list of the people in attendance, including their home addresses and pre-institute school addresses is included as Appendix I.

The following table shows the distribution of participants by States:

TABLE 1 - DISTRIBUTION OF PARTICIPANTS BY STATES

State	Number of Teachers
ARIZONA	1
ARKANSAS	1
CALIFORNIA	9
COLORADO	1
HAWAII	1
ILLINOIS	1
KANSAS	1
MARYLAND	1
MICHIGAN	1
NEW JERSEY	1
NEW MEXICO	1
OKLAHOMA	1
SOUTH DAKOTA	1
TEXAS	1
UTAH	1
WASHINGTON	1
TOTAL:	24

Two of the participants indicated they will be changing teaching assignments for the coming year, but didn't have their school addresses prior to the preparation of this report. One has accepted a new industrial arts teaching position in a secondary school, and the other will be teaching in industrial arts teacher education on a one year assignment. The entire class was asked to keep us informed of their mailing addresses and changed assignments. As a result, an up-to-date mailing list should be available, as needed, during the next school year.

Prior to the start of the summer session, a second letter was sent to the remaining twenty-one alternates explaining that positions still might be available, but that the chances of joining the institute were not good for current year. A copy of this letter is included as Appendix J.

No unanticipated problems developed during this phase of preplanning. The efficient maintaining of records and prompt replies to all correspondence is credited to an efficient institute secretary.

Communications with Participants in Preparation for Their Attendance - Once the class had been established, the problems of bringing the group to San Jose, providing for appropriate housing, and considering the numerous needs of the participants and families was undertaken. Basically, this phase consisted of the following activities:

1. Preparation and mailing of letter to all participants on May 3, 1967, regarding housing (included as Appendix K). This letter provided for a variety of housing and attempted to provide a realistic picture of available housing. The problem of refunds was described since this can be a major source of concern, and seriously distract participants from instruction.

   Attached to the letter was a question form which encouraged questions regarding any aspects of the Institute.

2. Preparation and mailing of letter to all participants on May 17, 1967, regarding stipend payments, invitation to a barbecue, suggested study, and other miscellaneous information. A copy is included as Appendix L.

   Attached to the letter was a request for information regarding their housing and travel plans.

3. Preparation and mailing of a Question and Answer report to all participants on May 29, 1967. This report was prepared in response to the questions asked by the participants as they responded to the May 3 letter. A copy is attached as Appendix M.

4. In addition to the letters noted, other information was mailed as it became available. This included:

    a. Name and addresses of all industrial arts teachers selected for the institute.

    b. Course outline and list of text and reference books on industrial materials.

    c. Maps of San Jose and brochures describing recreational activities in the Bay Area.

Considerable correspondence occurred during this phase of the preplanning. One unexpected problem developed with housing. One person wished to bring his trailer and had contacted a number of parks for reservations without receiving a reply. Following his letter, the institute secretary made a survey of the trailer parks in the area and discovered that none would make prior commitments and that all were quite crowded. Fortunately, when this person arrived, he found a vacancy at his first choice.

In general, this phase of preplanning was conducted without difficulty. Experiences with a previous institute aided the preplanning of this one.

Preplanning of the Instructional Program - Each of the principle faculty members planned his part of the instructional program. A number of meetings were held to coordinate planning. As a result, the program was planned and ready to begin on Monday, June 19, 1967.

Orientation of Participants

The orientation of participants was a continuous process, beginning with the initial letter of acceptance and continuing throughout the Institute. The correspondence described during the previous pages was directed toward orientating the participant to both the community and instructional program.

On Sunday, June 18, 1967, the day before the Institute began, all participants and their families were invited to a barbecue at the Director's home. The purpose was to informally become acquainted with the staff and with the other participants. This barbecue was followed by an orientation session on Monday morning. During this session, registration was completed, and reports presented by the various faculty members responsible for different aspects of the instructional program.

In addition, the staff was always available to assist the participants with both institute and personal problems generated by their absence from home.

Physical Facilities

The physical facilities used by the Institute were adequate and met every need of the participants. Four rooms were assigned to the exclusive use of the Institute. These included a large classroom (portion of electronics lab), the industrial materials lab, a connecting small classroom, and the general industrial arts laboratory facility. In addition, all other areas of the building were available for use as needed. These included extensive facilities in drafting, woodworking, metals and machine-tool, electricity/electronics, automotive and power, industrial design, and graphic arts.

One problem was anticipated but was solved prior to the start of the Institute. The Art Department conducts glass blowing classes directly across the hall from the general industrial arts laboratory. Due to ventilation problems, the exhause of hot air was made into the corridor, causing increased temperatures in all adjacent rooms. The problem was solved through the purchase of additional fans, and the air flow revised so the exhause went out of the window.

EVALUATION - SUMMER PROGRAM

The suggested format for this report will be modified for items 6-12, permitting a descriptive presentation of the summer program. The Institute was divided into two principle phases of operation:

1. Technological Study of Industry
2. Integration of Industrial Materials into Existing Industrial Arts Programs

A third phase, new instructional media, was integrated into the second, or curriculum phase of the program.

The typical daily schedule followed was:

8:00 - 9:45 - Phase 1 presentation - discussion-demonstration, audio-visual presentation, etc.
9:45 - 10:00 - Coffee-refreshment break, informal discussion.
10:00 - 11:30 - Phase 1 laboratory period - experiments and testing to enforce content presentation.
11:30 - 12:30 - Lunch.
12:30 - 2:15 - Phase 2 presentation - seminar meetings, discussions-demonstrations, guest speakers, etc.
2:15 - 2:30 - Coffee-refreshment break, informal discussion.
2:30 - 4:00 - Phase 2 laboratory period - development of teaching devices and experiments planned for secondary school students.

Day-by-Day Schedule Course Content

A day-by-day presentation of course content is included to permit the reader to review the instructional programs conducted during the Institute. The entries are brief so that the report can be kept to a reasonable size.

INDUSTRIAL MATERIALS

Date: 19 June 67

Time: 8:30 - 11:30

Type of Instruction: Opening Session

Instructor: Dr. Ralph Bohn, Director

Topic: Orientation

Content: Dr. Bohn introduced Dr. Robert Moore, Dean of the School of Applied Arts and Science, who gave a welcome address to the group. Registration was completed and the group was given a tour of the Industrial Arts Building.

Date: 19 June 67

Time: 12:30 - 4:00

Type of Instruction: Lecture

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Orientation to the Industrial Materials Laboratory

Content: Mr. Melo put into perspective the rapid growth of new materials in industry. The participants wrote a comprehensive two hour examination.

Date: 20 June 67

Time: 8:00 - 10:50

Type of Instruction: Lecture

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Bonding Mechanisms

Content: Mr. Melo described the primary and secondary molecular bonds. Crystalline structures were contrasted to amorphous structures.

Date: 20 June 67

Time: 11:00 - 11:30

Type of Instruction: Demonstration

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Stress-Strain Curves

Content: The tensil machine was used to show the relationship between stress and strain, elasticity and plasticity.

Date: 20 June 67

Time: 12:30 - 1:30

Type of Instruction: Demonstration

Instructor: Mr. Syd Lee, Assistant
San Jose State College

Topic: Spectroscopy

Content: The value of the spectrograph to quality control in industry was described. It was shown how the spectrograph is used to identify unknown metallic elements by examination of spectral line photographs.

Date: 20 June 67

Time: 1:45 - 4:00

Type of Instruction: Mr. Louie Melo, Professor
San Jose State College

Topic: Corrosion

Content: Mr. Melo showed how a number of simple experimental corrosion cells could be set up to demonstrate corrosion protection.

Date: 21 June 67

Time: 8:00 - 10:15

Type of Instruction: Lecture

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Properties of Metals and their Alloys

Content: The physical and mechanical properties of ferrous and non-ferrous metals were examined. The value of alloy phase diagrams was shown.

Date: 21 June 67

Time: 10:30 - 11:30

Type of Instruction: Demonstration

Instructor: Mr. Syd Lee, Assistant
San Jose State College

Topic: Photomicrography

Content: Mr. Lee demonstrated how the microscope and attached camera is of value in studying industrial materials. Preparation of both metal and organic materials was described.

Date: 21 June 67

Time: 12:30 - 2:30

Type of Instruction: Demonstration

Instructor: 3M Audio-Visual Sales Representative

Topic: Audio-Visual Equipment

Content: New audio-visual teaching aids were demonstrated.

Date: 21 June

Time: 3:00 - 4:00

Type of Instruction: Lecture

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Heat Treatment

Content: The heat treatment of aluminum alloys were described by means of lecture and film.

Date: 22 June 67

Time: 8:00 - 10:00

Type of Instruction: Lecture-Demonstration

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Corrosion

Content: Corrosion and methods of protection were described. The destructive power of oxygen on a metal at high temperature was demonstrated by means of an oxy-acetylene torch.

Date: 22 June 67

Time: 10:15 - 11:30

Type of Instruction: Lecture-Demonstration

Instructor: Mr. Syd Lee, Assistant
San Jose State College

Topic: Powder Metallurgy

Content: The metal forming process known as powder metallurgy described blending, compacting, and sintering. A simple experimental procedure which could be performed in the high school metal shop was demonstrated.

Date: 22 June 67

Time: 12:30 - 3:15

Type of Instruction: Lecture

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Wood

Content: Mr. Melo compared the cellular structures of hard and softwoods and spring and summer woods. Wood moisture content and shrinkage problems were described.

Date: 22 June 67

Time: 3:30 - 4:00

Type of Instruction: Demonstration

Instructor: Mr. Syd Lee, Assistant
San Jose State College

Topic: Particle Boards

Content: The formation of a particle board specimen and the testing of its resistance to water absorption was demonstrated.

Date: 23 June 67

Time: 8:00 - 11:30

Type of Instruction: Lecture-Demonstration

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Fuels

Content: The fuel-air ratio for efficient combustion was discussed and reinforced through lab experimentation. Terms such as volatility, blended gasolines and vapor-lock were defined.

Date: 23 June 67

Time: 12:30 - 4:00

Type of Instruction: Lecture

Instructor: Eastman Kodak Representatives

Topic: Photo-etching, Photo-milling

Content: The value of the photo-etching process to the electronics industry was outlined.

Date: 26 June 67

Time: 8:00 - 11:30

Type of Instruction: Lecture-Demonstration

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Lubricants

Content: The effect of temperature, load, speed and chemicals on lubricant performance.

Date: 26 June 67

Time: 12:30 - 2:30

Type of Instruction: Lecture

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development in Industrial Materials

Content: Attendees received orientation to the curriculum development section of the Institute. Review was given of lab facilities available to students including plastics, metals and woods, which are to be used in fabricating simple teaching aids for materials.

Date: 26 June 67

Time: 2:30 - 3:30

Type of Instruction: Demonstration

Instructor: Mr. Ed Mannion, Assistant
San Jose State College

Topic: Teaching Aids

Content: Sample devices were reviewed to explain the simplicity recommended in fabrication of a device to test or probe properties of materials of industry. Sample devices showed: (1) The effect of temperature in expansion and contraction of various metals. (2) Holding power of sheet metal joints.

Date: 26 June 67

Time: 3:30 - 4:00

Type of Instruction: Consultation and Demonstration

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Individual Planning

Content: Students began initial planning and sketching of new teaching aids or projects to be used in demonstrating and reducing the abstraction level of various materials.

Date: 27 June 67

Time: 8:00 - 11:30

Type of Instruction: Lecture

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Plastics

Content: The distinguishing characteristics of the major families of plastic materials were studied. Experimentation was performed with plasticizers, epoxy coatings, phenolic laminates and extrusion of polypropylene.

Date: 27 June 67

Time: 12:30 - 1:30

Type of Instruction: Seminar

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Teaching Aids

Content: Construction and planning of instructional aids was discussed with the use of teaching aids in a materials curriculum receiving special attention.

Date: 27 June 67

Time: 1:30 - 4:00

Type of Instruction: Individual Assistance

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Consultation

Content: Participants continued sketching and detailing of apparatus to be fabricated. Dr. Stephenson provided individual assistance and direction.

Date: 28 June 67

Time: 8:00 - 9:45

Type of Instruction: Lecture

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Adhesives

Content: The setting characteristics of the major families of adhesives were studied. Consideration was given to the selection of the correct adhesive for the particular application.

Date: 28 June 67

Time: 10:00 - 11:00

Type of Instruction: Demonstration

Instructor: Mr. Syd Lee, Assistant
San Jose State College

Topic: Wood Experimentation

Content: The moisture content of a number of wood samples was checked with the electric moisture content meter. A variety of adhesives were checked for their bonding strength using the tensile machine.

Date: 28 June 67

Time: 11:00 - 11:30

Type of Instruction: Lecture

Instructor: Dr. Ralph Bohn, Director

Topic: Refrigeration

Content: Dr. Bohn described the structure of several common refrigerants and then reviewed the basic principles of refrigeration.

Date: 28 June 67

Time: 12:30 - 1:30

Type of Instruction: Lecture-Demonstration

Instructor: Student, Weldon Griffith

Topic: Crystals and Light

Content: The presentation covered the polarized microscope and its uses for showing crystalline structure of various salts. The microscope, obtained from the Bell Telephone Educational Department in New York, was titled: Science Kit #4 - Experiments with Crystals and Light.

Date: 28 June 67

Time: 1:30 - 4:00

Type of Instruction: Individual

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Instructional Aids

Content: Students continued individual activity on instructional aids.

Date: 29 June 67

Time: 8:00 - 11:00

Type of Instruction: Lecture-Demonstration

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Coatings

Content: The characteristics of the major families of coating materials along with selection considerations, were discussed. A coating (and a printing ink) were prepared from basic raw materials.

Date: 29 June 67

Time: 11:00 - 11:30

Type of Instruction: Demonstration

Instructor: Mr. Syd Lee, Assistant
San Jose State College

Topic: Covering Ability

Content: Mr. Lee demonstrated the use of the fineness of grind gage in determining pigment particle size. The relative covering ability or opacity of several coatings was determined.

Date: 29 June 67

Time: 12:30 - 1:30

Type of Instruction: Lecture

Instructor: Mr. Ed Mannion, Assistant
San Jose State College

Topic: Di-Electric Wood Welder

Content: Discussion centered on wood as a material and the induction method of wood welding with an adhesive.

Date: 29 June 67

Time: 1:30 - 4:00

Type of Instruction: Individual

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development

Content: Student activity on individual instructional aids, and the development of curriculum units.

Date: 30 June 67

Time: 8:00 - 11:30

Type of Instruction: Demonstration

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Lab Facilities

Content: A description of the equipment available in the lab for experimentation was given. The participants began their experimentation working in teams of two.

Date: 30 June 67

Time: 12:30 - 2:00

Type of Instruction: Lecture

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development

Content: Progress on individual teaching aids was reviewed. Requirements for the write-up covering one curriculum unit were to include major headings of: (a) Introduction, (b) Objectives, (c) Materials and Equipment, (d) Utilization in the teaching-learning environment, (e) Observations and Conclusions, and (f) Terms and References.

Date: 30 June 67

Time: 2:00 - 4:00

Type of Instruction: Individual Assistance

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development

Content: Assistance was provided to individual students in writing curriculum units and constructing instructional aids.

Date: 5 July 67

Time: 8:00 - 11:30

Type of Instruction: Lecture-Discussion

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Metals Curriculum

Content: Theory and experimentation in materials which could be introduced into the high school metals program were discussed. Lab experimentation followed.

Date: 5 July 67

Time: 12:30 - 4:00

Type of Instruction: Individual

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development

Content: Students worked individually on devices for testing and checking material properties.

Date: 6 July 67

Time: 8:00 - 11:30

Type of Instruction: Lecture-Discussion

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Wood, Electricity and Electronics Curriculum

Content: Theory and experimentation in materials which could be introduced into the high school (wood and electricity and electronics) program were discussed. Lab experimentation followed.

Date: 6 July 67

Time: 12:30 - 1:00

Type of Instruction: Lecture and Questions

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: General Question Period

Content: General question period was held regarding facilities, environment, program and activities.

Date: 6 July 67

Time: 1:00 - 2:00

Type of Instruction: Lecture-Demonstration

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Engravo-Graph Machine

Content: The use and application of the engravograph machine was demonstrated, emphasizing the advantages of providing professional labels for instructional aids.

Date: 6 July 67

Time: 2:00 - 4:00

Type of Instruction: Individual Assistance

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development

Content: Students participated in individual activity on instructional aids.

Date: 7 July 67

Time: 8:00 - 11:30

Type of Instruction: Lab Activity

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Lab Experimentation

Content: Lab experimentation was conducted throughout the morning.

Date: 7 July 67

Time: 12:30 - 4:00

Type of Instruction: Instructional Materials

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development

Content: Students were engaged in individual activity in constructing instructional aids and writing curriculum units.

Date: 10 July 67

Time: 8:00 - 9:15

Type of Instruction: Discussion

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: General Question and Answer Period

Content: A general question and answer period was held covering all areas of industrial materials.

Date: 10 July 67

Time: 9:30 - 11:30

Type of Instruction: Lecture-Demonstration

Instructor: Mr. Syd Lee, Assistant
San Jose State College

Topic: Metals--Coatings

Content: The importance of the lead-tin phase diagram to the understanding of the working characteristics of various solders was described and reinforced through demonstration. The value of the gloss and reflectance meters in the study of materials was shown. Lab experimentation followed.

Date: 10 July 67

Time: 12:30 - 4:00

Type of Instruction: Individual Assistance

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development

Content: The students worked on individual instructional aids and curriculum units.

Date: 11 July 67

Time: 8:00 - 11:30

Type of Instruction: Lecture

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Polymers

Content: Theory and experimentation with polymer materials suitable for inclusion in the high school industrial arts programs were discussed. Lab experimentation followed.

Date: 11 July 67

Time: 12:30 - 1:00

Type of Instruction: Lecture

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Content of Curriculum Unit Write-Ups.

Content: The write-ups and format of curriculum units were reviewed. Rather than following an experimental approach, the write-ups were to be used as an attempt to lower the abstraction level of materials making them understandable to youth.

Date: 11 July 67

Time: 1:00 - 4:00

Type of Instruction: Lecture-Demonstration

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Student Presentations

Content: Individual students presented their instructional aids. Explanations covered the sketch, purpose, grade level and various methods of presenting the concept associated with the article.

Date: 12 July 67

Time: 8:00 - 11:30

Type of Instruction: Field Trip

Topic: Plastics Processing

Content: The participants visited Haveg Industries, Inc., a Division of American Molding Company in San Leandro, where the molding of thermosetting and thermoplastic polymers was seen firsthand.

Date: 12 July 67

Time: 12:30 - 1:30

Type of Instruction: Discussion

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: American Molding Company Study Trip

Content: Students reviewed the processing of polymers observed in the morning.

Date: 12 July 67

Time: 1:30 - 4:00

Type of Instruction: Lecture-Demonstration

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Student Presentations

Content: Individual presentations were continued on instructional aids which test or explain the properties of materials. Methods of presentation to enhance student growth were constantly reviewed. Lab activity followed.

Date: 13 July 67

Time: 8:00 - 9:30

Type of Instruction: Lecture

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Plastic Molding Processes

Content: Mr. Melo reviewed the principles of operation of the molding machines seen at the American Molding Company in San Leandro.

Date: 13 July 67

Time: 9:45 - 11:30

Type of Instruction: Lecture-Demonstration

Instructor: Mr. Syd Lee, Assistant
San Jose State College

Topic: Specific Gravity, pH.

Content: Mr. Lee described how the specific gravity and pH of a variety of solutions could be determined. Lab experimentation followed.

Date: 13 July 67

Time: 12:30 - 4:00

Type of Instruction: Lecture-Discussion

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development

Content: Dr. Stephenson lectured on techniques of instruction in making plastic projects, including techniques in using coffee-maker heating unit, hot plate or waffle plates to construct heating platten for hydraulic press.

Catalogs dealing in plastic products, copon resins and decorative materials were introduced. A seminar discussion on classroom and related industrial uses of polyesters preceded the afternoon lab activities.

Date: 14 July 67

Time: 8:00 - 11:30

Type of Instruction: Lecture-Discussion

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Metals Curriculum

Content: Mr. Melo discussed methods of conducting experimentation in metals at the high school level. Lab experimentation followed.

Date: 14 July 67

Time: 12:30 - 4:00

Type of Instruction: Individual Assistance

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development

Content: Students participated in curriculum unit write-ups and construction of instructional aids.

Date: 17 July 67

Time: 8:00 - 11:30

Type of Instruction: Lecture-Demonstration

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Electricity and Electronics Curriculum

Content: Mr. Melo discussed methods of conducting experimentation with materials used in electricity and electronics at the high school level. Lab experimentation followed.

Date: 17 July 67

Time: 12:30 - 4:00

Type of Instruction: Seminar

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development

Content: A meeting was held with automotive people to discuss curriculum innovations and methods of implementing material concepts. Remaining students worked on individual instructional aids.

Date: 18 July 67

Time: 8:00 - 8:45

Type of Instruction: Lecture-Discussion

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Drafting Curriculum

Content: Theory and experimentation in materials which could be introduced into the high school mechanical and architectural drafting programs were discussed.

Date: 18 July 67

Time: 9:00 - 11:30

Type of Instruction: Lecture-Discussion

Instructor: Mr. Bill Stavosky, Re-Examination Supervisor, Underwriters Laboratories

Topic: Materials Testing

Content: The materials testing program carried out in the Underwriters Laboratories Building in Santa Clara was described by Mr. Stavosky. The film, "Building for Safety" was shown. Lab experimentation followed.

Date: 18 July 67

Time: 12:30 - 1:00

Type of Instruction: Discussion

Instructor: Dr. Leslie Stephenson, Professor San Jose State College

Topic: General

Content: A general questions session was held.

Date: 18 July 67

Time: 1:00 - 4:00

Type of Instruction: Seminar

Instructor: Dr. Leslie Stephenson, Professor San Jose State College

Topic: Curriculum Development

Content: A curriculum seminar was conducted with the metals area students to discuss teaching aids, method of use, the concept to be conveyed and the objective in the teaching-learning experience. Other students worked on individual teaching aids or instructional devices for conveying the properties of various materials.

Date: 19 July 67

Time: 8:00 - 11:30

Type of Instruction: Lecture-Discussion

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Graphic Arts Curriculum

Content: Materials experimentation which could be introduced into the high school graphic arts program was discussed. Lab experimentation followed.

Date: 19 July 67

Time: 12:30 - 4:00

Type of Instruction: Lecture-Seminar

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development - Woods

Content: Dr. Stephenson met with the woods area students to review curriculum ideas, unit write-ups, methods of presentation, concept, content and industrial uses of wood. Remaining students worked on individual instructional aids.

Date: 20 July 67

Time: 8:00 - 8:30

Type of Instruction: Lecture-Discussion

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Electronics Curriculum

Content: Theory and materials experimentation which could be introduced into the high school electronics program were discussed.

Date: 20 July 67

Time: 8:45 - 11:30

Type of Instruction: Lecture

Instructor: Mr. Worth Barton, Chief Engineer,
Fairchild Electronics, Mountain View,
California.

Topic: The Semi-conductor Business

Content: Mr. Barton described how modern semiconductor materials are made for transistor applications. Lab experimentation followed.

Date: 20 July 67

Time: 12:30 - 1:30

Type of Instruction: Lecture-Demonstration

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Vacuum Forming

Content: A demonstration was given of the process for vacuum forming plastics and its application in industry. The material used was mylar acetate.

Date: 20 July 67

Time: 1:30 - 4:00

Type of Instruction: Seminar

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development - Electronics

Content: A curriculum seminar was conducted with Electronics area students. New innovations in teaching techniques and methods of explaining the concept were discussed. Remaining students worked on instructional aids.

Date: 21 July 67

Time: 8:00 - 9:15

Type of Instruction: Discussion

Instructor: Mr. Louie Melo, Professor
San Jose State College

Content: A general question and answer period was held covering all areas of industrial materials.

Date: 21 July 67

Time: 9:30 - 10:30

Type of Instruction: Demonstration-Lecture

Instructor: Mr. Bill Nemy, District Manager, Brodhead Garrett Company, Sacramento, California

Content: Mr. Nemy described the tests which could be performed with the Vega Universal Testing Machine designed specifically for high school applications.

Date: 21 July 67

Time: 10:30 - 11:30

Type of Instruction: Demonstration

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Crystal Growth

Content: By means of alum crystal growth, Mr. Melo described how metal crystals begin to form and grow during solidification. Lab experimentation followed.

Date: 21 July 67

Time: 12:30 - 1:00

Type of Instruction: Discussion

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: General

Content: A general session of questions and answers relating to industries in the area was held.

Date: 21 July 67

Time: 1:00 - 4:00

Type of Instruction: Seminar

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development

Content: Dr. Stephenson met with graphic arts and drafting area students to discuss curriculum materials and development. Other students worked on teaching aids and curriculum unit write-ups.

Date: 24 July 67

Time: 8:00 - 9:30

Type of Instruction: Lecture-Discussion

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Automotive - Power Mechanics Curriculum

Content: Mr. Melo described methods of conducting materiasl expetiments within the automotive and power mechanics courses in the high school.

Date: 24 July 67

Time: 9:45 - 11:30

Type of Instruction: Lecture

Instructor: Dr. Ralph C. Bohn, Director

Content: Dr. Bohn described the NDEA Institute programs he visited in Puerto Rico and Florida. Lab experimentation followed.

Date: 24 July 67

Time: 12:30 - 4:00

Type of Instruction: Seminar

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Development

Content: Dr. Stephenson continued the curriculum construction discussion with drafting areas students. The rest of the group was engaged in work on teaching aids or unit write-ups. All students participated in lab activity following the seminar.

Date: 25 July 67

Time: 8:00 - 11:30

Type of Instruction: Lecture-Demonstration

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: Wood Structure

Content: Mr. Melo presented a lesson and demonstration on wood structure, as related to wood turning, to eight children of the participants. The children's ages ranged from 13 to 16 years. Lab experimentation followed.

Date: 25 July 67

Time: 12:30 - 4:00

Type of Instruction: Lecture and Seminar

Instructors: Dr. Leslie Stephenson, Professor
San Jose State College

Dr. Paul Manchak
United States Office of Education
Washington, D.C.

Topic: NDEA Institutes and Progress

Content: Dr. Stephenson introduced Dr. Manchak who explained federal legislation involving Industrial Arts and answered questions from students. Lab activity on instructional aids followed.

Date: 26 July 67

Time: 8:00 - 11:30

Type of Instruction: Discussion

Instructor: Mr. Louie Melo, Professor
San Jose State College

Content: Mr. Melo divided the participants into four groups and met with each separately at scheduled times . The groups were: junior high school teachers, senior high school teachers, supervisors and administrators and teacher educators. The weaknesses and strong points of the institute program were discussed. Lab experimentation continued throughout the morning.

Date: 26 July 67

Time: 12:30 - 4:00

Type of Instruction: Lecture-Discussion

Instructor: Dr. Leslie Stephenson, Professor
San Jose State College

Topic: Curriculum Information

Content: A handout on oil additives was distributed, followed by open discussion on oil products. Students write-ups and format of curriculum units were reviewed. Laboratory activity on instructional aids followed.

Date: 27 July 67

Time: 8:00 - 11:30

Type of Instruction: Discussion

Instructor: Mr. Louie Melo, Professor
San Jose State College

Content: A general question and answer period for all areas of industrial materials was held. Lab experimentation continued.

Date: 27 July 67

Time: 12:30 - 1:00

Type of Instruction: Lecture-Demonstration

Instructor: Mr. Ed Mannion, Assistant
San Jose State College

Topic: Plastic Blow Molding

Content: A demonstration was held on plastic blow molding using acrylic sheets.

Date: 27 July 67

Time: 1:00 - 4:00

Type of Instruction: Study Trip

Instructor: Host - General Electric

Topic: Materials in the Boiling Water Reactor

Content: A study trip to General Electric was arranged for a lecture by materials scientists in the field of atomic power. Two short films on the Boiling Water Reactor were supplemented by lecture.

Date: 28 July 67

Time: 8:00 - 11:30

Type of Instruction: Discussion

Instructor: Mr. Louie Melo, Professor
San Jose State College

Topic: The Boiling Water Reactor

Content: Following a general clean-up of the lab, Mr. Melo discussed the operation of the boiling water atomic reactor as a follow-up to the field trip to the General Electric Atomic Power Equipment Department in San Jose.

Date: 28 July 67

Time: 12:30 - 2:00

Type of Instruction: Lecture and Discussion

Instructors: Dr. Ralph Bohn, Director

Dr. Paul Manchak
United States Office of Education
Washington, D.C.

Topic: Evaluation Comments

Content: A question and answer period preceded farewell comments by Dr. Bohn and Dr. Manchak. Institute adjourned.

Instructional Materials Planned and Developed

Each participant studied the problem of teaching industrial materials in secondary education. In order to lower the level of abstraction, experiments were sought which would help the average secondary school student understand industrial materials as part of his study of industrial arts.

The result of this study was the planning and developing of numerous devices and experiments to be conducted with the device. Most devices were made so that they could be tested and perfected, and typical data reviewed. Appendix N contains a sample of the written presentation and plan for one experiment or teaching unit.

A total of 60 units were planned. These units were duplicated and assembled into an appropriate folder. Each participant received a copy of this folder so that they could profit from the work of all in attendance. A limited number of additional copies were made and will be distributed, upon request, to persons interested in the Institute.

The following list of units for experiments were developed by the participants during the Institute and are included in the folder of instructional units.

A Beam Deflection Testing Device - Hansen & Petersen
A Forming Device For Making Wooden Test Pellets From Shavings - Jones
A Powder Metallurgy Die - Bockman
Basic Hydraulic Press - Mankamyer
Beam Tester - Sellarole
Bending of Wood - Currie
Bending Strength of Woods - Cropley
BiMetallic Property of Metal - Birks
Blow Molding - Mankamyer
Capacitor - Resistor Panel - Hoskins
Conductivity of Metals - Hoskins
Drawer Joint Testing Apparatus - Raybourn
Elasticity Tester - Tallerico
Expansion and Contraction Test Apparatus - Powers
Extreme Pressurd Lubricant Tester - Demchuck
Grain Deformation - Visual Aid - Jones & Whitt
Graphic Flux Line Demonstration - Powers
Guided Bend - Weld Tester - Griffith
Hammer Die for Powder Metallurgy - Griffith
Hardness of Different Species of Woods - Cropley & Horvath
Hardness Tester - Tallerico
Heat Platens for Hydraulic Press - Mankamyer
Internal Pressures of Wood - Hanses & Petersen
Joint Tester - Sellarole
Lead Acid Storage Battery Action - Powers
Letterpress Type Plate Height Indicator - Johnson
Papermaking by the Chemical Process - Whitt
Paper Strength Tester & Grain Indicator - Johnson
Particle Board Formation - Spring
Plywood Visual Aid - Whitt

Powder Metallurgy - Spring
Relative Brittleness of Un-Sintered Briquettes Made of Powdered Metal - Spring
Relative Hardness and Brittleness of Sintered Briquettes Composed of Powdered Metal - Spring
Relative Heat Conductivity of Metal - Cropley & Horvath
Relative Viscosity Tester - Bubble Type - Demchuck
Shear Test Wood Chip Jig - Mankamyer
Sintering Powdered Metal Briquettes in Oxygen - Free Furnace - Spring
Slip Plane Concept of Metal - Hoskins
Specific Gravity of Wood - Hansen & Petersen
Strength Testing Apparatus - Keith
Table Edge Heating Block - Raybourn
Tensile Strength - Griffith
Tensile Strength Tester - Tallerico
Tensile Strength Tester for Leather - Schneider
Tensile Tester Chucks- Oetinger & Rushing
Tensile Testing - Spring
Tester for Wood Bend Radius - Sellarole
Testing Dielectric Properties of Air Under Pressure & Vacuum - Demchuck
The Critical Point of Carbon Steel - Oetinger & Powers
The Production of Nylon 6/6 - A Classroom Demonstration - Hansen & Petersen
Thermal Conductivity Tester - Tallerico
Torsion Testing Device - Bockman
Variable Compression Ratio Cylinder Head for Can Internal Combustion Engine - Nesbitt
Visual Aid Thermoplastic & Thermosetting - Whitt
Wire Drawing - Mankamyer
Wood Expansion - Hansen & Petersen
Wood Joint Tester - Sellarole
Wood Porosity Tester - Currie
Wood Particle Board Expansion Tester - Raybourn
Wood Technology Experiments - Keith

Field Trips, Industrial Demonstrations, Guest Speakers

During the Institute, limited use was made of field trips, demonstrations and guest speakers. These included:

1. Demonstrati

1. Demonstrations

    a. 3M Audio-Visual Demonstration. This consisted of a demonstration of the use of the overhead projector, making of transparencies, and the use of related audio-visual devices.
    b. Eastman Kodak Photographic Demonstration. This consisted of a demonstration of photo-etching, photo-milling, and the value of these processes to industry.
    c. Brodhead Garrett Company Demonstration. This consisted of tests which could be performed with the Vega Universal Testing Equipment.

2. Field Trips

   a. Haveg Industries, Inc., Division of American Molding Company, San Leandro. The field trip was in the area of plastics processing and emphasized the molding of thermosetting and thermoplastic polymers.
   b. General Electric Corporation, Boiling Water Reactor Facility. This trip illustrated the importance of materials in the atomic energy program.

3. Guest Lecturers

   a. Mr. Bill Stavosky, Re-examination Supervisor, Underwriters Laboratories. The material testing program conducted by Underweiters Laboratories were described.
   b. Mr. Worth Barton, Chief Engineer, Fairchild Electronics. Mr. Barton described how modern semi-conductor materials are made for transistor applications.

In addition,to the special demonstrations and activities listed in 1-3 above, the staff presented numerous demonstrations related to the instructional program.

Films, overhead projector, opaque projector and various other teaching devices were used during the Institute to supplement instruction.

All of the activities listed in this section contributed to the total progress of the Institute. The generally lower evaluation of some of these activities when compared to the regular instructional program indicates that considerable care should be exercised in developing this phase of the program for future Institutes.

Institute Staff

The instructional staff consisted of the following:

1. Two full time faculty members, each in charge of one of the major divisions of the Institute.

   a. Louie Melo, Professor of Industrial Arts, San Jose State College
   b. Leslie E. Stephenson, Professor of Industrial Arts, San Jose State College

2. Two full time teaching assistants. One assistant worked with each of the regular faculty members in planning and conducting the program.

   a. Ed Mannion, Instructor of Industrial Arts Utah State University
   b. Syd Lee, Instructor of Industrial Arts University of British Columbia.

3. Two part-time teaching assistants. Both teaching assistants worked directly with the participants and faculty in planning and designing teaching devices developed as part of the Institute. These assistants were industrial design majors and possessed special talents for this phase of the program.

   a. Harold Wells II, Teaching Assistant,
      San Jose State College
   b. Rosalind Fletcher, Teaching Assistant,
      San Jose State College

An evaluation of the staff is included in the final sections where student evaluations are presented in detail. Basically, the selection of the total institute staff was appropriate, and everyone fulfilled their responsibilities at the expected high level of performance.

EVALUATION - CONTENT AND STUDENT EVALUATION REPORTS

The formal evaluation conducted prior to the completion of the Institute consisted of a formal content evaluation, student questionnaire, and faculty evaluation. A follow-up evaluation is planned for the 1967-68 school year.

Content Examination

A written objective examination consisting of 300 questions was administered on the opening day of the Institute and was repeated on the Wednesday before termination of the program. The table on the following page shows the results of this before and after examination.

A review of the table will show that all students made significant progress during the Institute. Due to a variety of backgrounds and previous learning experiences, the test scores had a wide range for both examinations. The following observations are based on the test scores:

TABLE 2 - BEFORE AND AFTER TEST SCORES

BEFORE TEST - JUNE 19, 1967			AFTER TEST - JULY 26, 1967		
Student Number	Raw Score[1]	Percentage Correct	Student Number	Raw Score[1]	Percentage Correct
16	197	66%	16	263	88%
17	190	63	2	256	85
11	189	63	12	253	84
12	188	63	11	252	84
10	185	62	10	250	83
22	183	61	23	249	83
8	180	60	1	247	82
2	178	59	8	246	82
1	174	58	17	246	82
21	173	58	6	244	81
6	170	57	13	242	81
23	168	56	15	237	79
3	159	53	22	237	79
14	158	53	20	228	76
20	153	51	9	227	76
13	152	51	18	223	74
18	152	51	24	223	74
9	151	50	14	220	73
7	143	48	3	215	72
24	143	48	7	214	71
15	142	49	21	214	71
5	141	49	5	209	70
4	136	46	19	200	67
19	121	40	4	195	65
Mean	163.6	54.5%		233.0	77.7%
Median	163.5	54.5%		237.0	79.0%
Range	76	26%		68	23%

[1] Raw Score is based on a possible total of 300

1. All participants improved their test scores by a significant amount.
2. In general, each participant maintained a rank order position on the post-test close to the one established on the pre-test.
3. The highest score of the pre-test was equal to the lowest score on the post-test.
4. The range of scores decreased between the tests, indicating greater growth by those with minimum backgrounds.

Since the test had been given to groups previous to the Institute, a comparison between Institute participants and the last group taking the exam was possible. The range of the previous group was: Raw Score - 182 to 256, Percentage - 61% to 85%, Mean Raw Score - 226, Mean Percentage - 75.1%. A comparison of these figures with those of Table 2, shows that the Institute group showed superior test results.

Participant Evaluation of Institute

Two daysprior to the termination of the Institute, each participant was given an evaluation form which permitted an anonymous evaluation of all phases of the Institute. The form was returned on the last day of the Institute. A copy of the form is included as Appendix O. The analysis of the responses is shown below. Comments are listed after each question. The number in parenthesis indicates the frequency of the comment. When no number is listed, the frequency is two. Frequencies of one are not included with this report, but were reviewed and considered by the director and faculty.

Question I. Which phase of morning program was most valuable?

Strength	Frequency
Lecture	12
Demonstrations	6
Total Program	4
Experiments and Write-up	2
Weaknesses	
Student Experiments and Write-up	9
None	8
Demonstrations	2
Technical Portion	2
General Discussion	2
Lecture	1

Summary of Comments:

A number of students (3)* stated that the total A.M. session was of great value to them and recommended no changes. Others (3) expressed satisfaction in the opportunity to select lab experiments which would be of value to them and their students. The demonstrations were most valuable for providing a conceptual working knowledge of the function of materials. The amount of time, study and organization spent in preparation was evident.

Students (5) commented that a more structured lab program would have provided them with a more directed set of goals. Following the half-way point of the Institute, the pace was adjusted and the students (7) responded favorably. However, the need for additional time to cover the material in greater depth was also expressed by some students (4). Periodic examinations were suggested as a means of reflecting to the student areas requiring additional study.

Question II: Which phase of the afternoon program was most valuable to you?

Strength Responses	Frequency
Total Program	7
Project Construction and Write-up	6
Development of Curriculum Ideas	6
Seminars	5
Weakness Responses	
None	10
Project Construction and Write-up	10
Demonstrations	2
Development of Curriculum Ideas	2

Summary of Comments

The open-ended curriculum session permitting students to work in areas of their choice received approval (5). Individual assistance by the instructor was beneficial in the development of curriculum information(3). The P.M. session (curriculum) was important for the effective application if instruction.

The establishment of a format for the curriculum write-up might have been more beneficial if developed earlier in the session (5). It was also expressed that more group discussions focusing on ideas and methods of integrating material's concepts into the curriculum would have correlated the A.M. session and P.M. session to an even greater degree (5).

*Number indicates times comment was made.

It was also suggested that the time ratio be adjusted to permit 2/3 of the day in the materials lab and 1/3 of the day devoted to development of curriculum ideas by small groups.

Question III.

Faculty Conducted Program		Frequency	
	Very Good	Good	Poor
3.1 Morning Instruction Industrial Materials Content			
3.11 Lectures	18	5	1
3.12 Demonstrations	18	4	2
3.2 Afternoon Instruction Curriculum and Instructional Materials			
3.11 Seminar and Group Activities	13	8	3
3.12 End Product and Usefulness of Group Activities	14	9	1
3.3 Pre and Post Test	11	11	2
3.4 Homework Assignments	6	15	3
3.5 Evaluation and Grading Procedures	11	11	0

Question IV.

Related Instructional Programs			
4.1 3M Presentation	0	11	13
4.2			
4.2 Kodak Presentation	0	3	21
4.3 Brodhead-Garrett Presentation	0	5	19
4.4 Field Trips	19	5	0
4.5 Guest Speaker - Underwriter	5	16	3
4.6 Guest Speaker - Industry	23	1	0

Question V.

Institute Related Procedures			
5.1 Overall organization of course schedule (schedule of activities)	11	12	1
5.2 Institute time schedule-class hours and days	16	7	1
5.3 Housing arrangements and handling of related problems	19	4	1

		Frequency	
	Very Good	Good	Poor
5.4 Social and recreational activities--providing of information	13	10	1
5.5 Payment of stipends-schedule of handling procedures	22	2	0
5.6 Communications and correspondence prior to Institute	22	2	0

Question VI.

Institute Support Staff

Services of:			
6.1 Director	22	2	0
6.2 Teaching Assistants:			
6.21 Industrial Materials (Morning)	118	6	0
6.22 Instructional Materials (Afternoon)	17	6	1
6.23 Design Assistants	19	5	0
6.3 Secretarial Services	21	3	0

Question VII.

If the Institute were to be repeated next summer, what specific changes would you recommend?[1]

Suggested that the dynamic pace of the first few weeks be modified to permit students to get an initial foundation. Students could benefit from a greater tie-in of lectures and demonstrations during a specific day. An increase in the number of lab experiences would be very helpful. This might require that fabrication of teaching aids be excluded but the curriculum unit write-ups should be retained. The format for the curriculum unit should be determined prior to the program and students should be given a copy at the initital class session.

The possibility of increasing the number of industry specialists invited to the campus should be investigated. Additional study trips, similiar to the General Electric trip, would enhance the total Institute.

The giving of examinations and the grading of assignments would assist student learning by indicating to him his weak areas. This would require a testing area that would be quiet and uncrowded.

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[1] Comments on questions VII and VIII are not shown by frequency. All students completed these sections, and the listed comments summarize the evaluation reports.

When planning the institute, it should be decided whether the structure will be open-ended with freedom for independent study, or very detailed and guided. Once established, this pattern should prevail for the duration of the institute, and then be evaluated.

Question VIII.

As a result of your experiences in the Institute, what tentative changes do you hope to make in your program?

Innovations in lectures and techniques of demonstrations will be incorporated immediately. Introduction of the why concept will be used to encourage students to probe industrial materials. Reference books and periodicals will be made available for student use.

Units in materials of industry will be incorporated into present programs with development on experimental programs in materials for the average industrial arts student.

The newly learned information will be utilized in the current curriculum units until complete courses of study can be revised. During the interval of revision, the acquired industrial materials information will be exchanged with other associates.

Prior to completing the evaluation form, the participants were asked to cooperate in a school year follow-up study. This study will consist of a mailed questionnaire designed to identify the effects the Institute has had on their instruction, the opportunities they have had to make presentations on industrial materials, and a general evaluation of the Institute in retrospect.

Director and Faculty Evaluation of Institute

Following the Institute, evaluative comments were obtained from the faculty members. These comments, coupled with the directors evaluation, are combined into the following sections.

Objectives - Primary objectives of teaching industrial materials to the participants, developing instructional and curriculum materials, and encouraging the use of new knowledge in the improvement of instruction were met. In fact, examination results, coupled with a subjective evaluation of the instructional materials indicates that the participants exceeded our expectations.

Optimum Number of Grade Levels Included - The Institute provided instruction for teachers from grades 7-12 and for supervisors and teacher educators. The spread was not too great. It provided for enrichment of discussion and a better understanding of secondary school industrial arts problems.

In the future, the division of groups would be modified. This Institute used the system of placing a teacher educator, supervisor, senior high school teacher and a junior high school teacher on each group. The groups were further classified by subject area within industrial arts. This did not prove as successful as anticipated. A more liberal approach to group activity would be used in the future. Groups would be organized by interest in common problems of instruction.

Beginning Dates - The majority of the participants were able to arrive for the Institute without schedule difficulty. However, a number of schools adjourned on the Friday prior to the start of the Institute. If the teacher had a long distance to travel, he had to hurry more than necessary.

If repeated, the Institute would be scheduled to start one week later.

Participants - Number and Selection - The number of participants seem appropriate. There was never more than one teacher per school and they represented most of the subject areas of industrial arts.

The teachers from drawing and graphic arts did not find as much application of instruction in their subjects as we had originally anticipated. Some consideration should be given as to whether teachers from these subjects should be included in the future.

Time, Ratio of Staff to Participants, Budget - These administrative and planning factors were adequate and offered no problems. USOE guidance was valuable in arriving at appropriate decisions prior to the submission of the Plan of Operation.

STATISTICAL REPORT

The statistical reports furnished by the Measurement Research Center of Iowa are included as Appendix P.

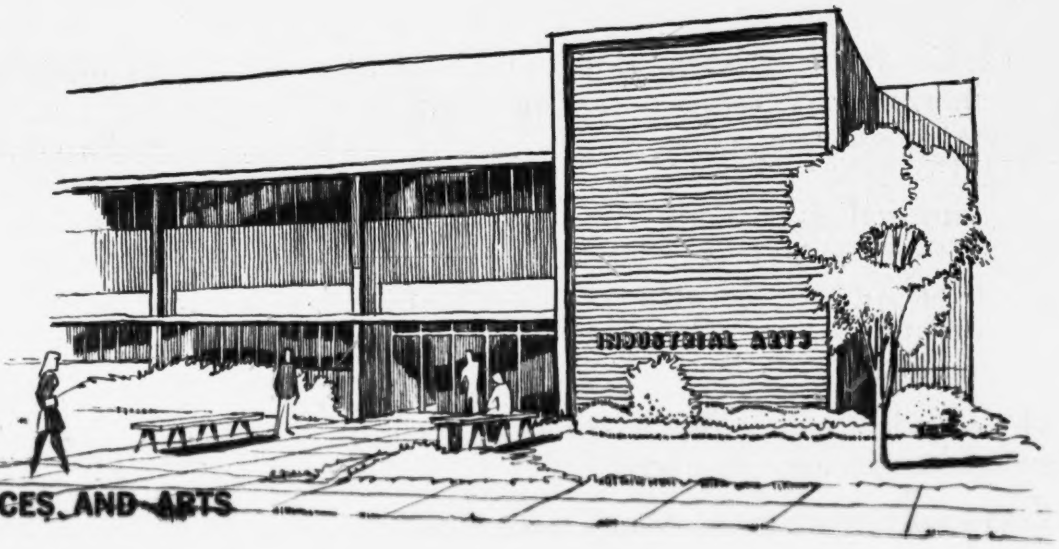
APPENDICES

APPENDIX A

Copy of Institute Brochure

SAN JOSE STATE COLLEGE

SCHOOL OF APPLIED SCIENCES AND ARTS



INDUSTRIAL MATERIALS

An NDEA Institute for Advanced Study in Industrial Arts in cooperation with the U. S. Office of Education as authorized under Title XI of the NDEA, as amended.

SUMMER, 1967 • June 19 - July 28

Department of Industrial Arts, San Jose State College, San Jose, California

A technical specialty institute planned for 24 industrial arts teachers of grades 7 - 12, industrial arts supervisors, and industrial arts teacher educators, preparation codes 1 and 2.

THE PROGRAM Organized instruction in the composition, physical and mechanical properties, and modification and selection of industrial materials is emerging as an important aspect of secondary school industrial arts. As a result, teachers are beginning to include instructional units on industrial materials into existing programs.

Teachers who have included instruction on industrial materials have identified a need for an inservice education program which provides an organized study of industrial materials. Important aspects of this need include both an organized study of materials (properties, selection, and modification), and the methods and procedures whereby instruction can be effectively integrated into instructional program using existing facilities.

This institute has been planned with these needs in mind. Instruction will be divided into two principal phases:

Phase 1 - Technological Study of Industrial Materials.
Instructor: L. Melo

Phase 2 - Integration of Industrial Materials into Existing Industrial Arts Programs.
Instructor: L. Stephenson

Instructional units included in Phase 1 will be:

- State of matter and general chemical structure
- Physical and mechanical properties
- Metals
- Wood and wood products
- Fuels and lubricants
- Plastic materials
- Adhesives
- Protective and decorative coatings
- Other materials - such as semi-conductors

Phase 2 will utilize the technical instruction of Phase 1, and develop methods and procedures whereby this instruction can be integrated into existing secondary industrial arts programs.

The entire program will combine both classroom and laboratory activities. The following is a typical daily schedule:

8:00- 9:45—Phase 1 presentation - discussion-demonstration, audio-visual presentation, etc.

9:45-10:00—Coffee-refreshment break, informal discussion.

10:00-11:30—Phase 1 laboratory period - experiments and testing to enforce content presentation.

11:30-12:30—Lunch.

12:30- 2:15—Phase 2 presentation - seminar meetings, discussion-demonstrations, guest speakers, etc.

2:15- 2:30—Coffee-refreshment break, informal discussion.

2:30- 4:00—Phase 2 laboratory period - development of teaching devices and experiments planned for secondary school students.

This schedule will be modified for study trips, guest lectures, and class activities.

TEXTBOOK: Laurence H. Van Vlack, *Elements of Materials Science,* Addison-Wesley Publishing Company, 1964. In addition to this textbook, each participant will be required to purchase special reference books in his subject area, at an average cost of $15-$20.

COURSE NUMBER AND TITLE: Industrial Arts 115s- Industrial Materials as an Integrated Part of the Industrial Arts.

CREDIT: Six units of upper division or graduate credit will be provided upon request.

INSTITUTE STAFF

DIRECTOR—Ralph C. Bohn, Chairman and Professor, Department of Industrial Arts, San Jose State College. Guest summer faculty member in industrial materials at Colorado State College and Arizona State University. President-elect, American Industrial Arts Association.

STAFF—Louie Melo, Professor of Industrial Arts, San Jose State College. Principal faculty member and developer of industrial materials at San Jose State College. Presentations on industrial materials at American Industrial Arts Association, American Vocational Association, California Industrial Arts Association and Oregon Industrial Educations Association.

Leslie E. Stephenson, Professor of Industrial Arts, San Jose State College. College teaching experience in industrial materials, wood, metals, plastics, automotive, and teaching methods and procedures.

FACILITIES The institute will use the extensive facilities of the industrial arts building at San Jose State College. Facilities which will be used include: industrial materials laboratory, woodworking laboratory, metalworking laboratory, and general purpose classroom. Two library collections will be available for use - the department industrial materials collection, and the extensive collections housed in the college library.

ELIGIBILITY Applicants must meet the following requirements:

- Three years teaching and/or supervisory experience as an industrial arts teacher (grades 7-12), supervisor, or teacher educator.
- Teaching area of metals, woods, plastics, graphic arts, electronics, auto and power, or general industrial arts (general shop).
- Bachelor's or Master's degree with a major in industrial arts (verified by college transcript).
- Contract or agreement to continue, during 1967-1968, teaching in grades 7-12, supervision, or teacher education requiring a knowledge of industrial materials.
- One year of college chemistry, including organic and inorganic chemistry. This requirement may be met by verified experience or self-study.
- Written recommendation of immediate supervisors (school principal or superintendent). This recommendation must indicate that the participating teacher will be encouraged to use institute experiences.
- Submission of a statement describing interest in industrial materials and its relationship to industrial arts instruction, and interest and reason for participation in the institute.

Before making an application for this institute, make certain you meet the eligibility requirements listed above and will be able to supply the necessary recommendations and statements. Appropriate forms will be sent upon receipt of the "Request for Application Forms" attached to this brochure.

NON-DISCRIMINATION CLAUSE San Jose State College does not discriminate on basis of race, color, creed, sex, or national origin.

SUBMISSION, NOTIFICATION, AND ARRIVAL DATES

- March 20, 1967—postmark deadline for submission of application, letters of recommendation, and transcript. In meeting this deadline, plan on receiving application forms ten days after submitting the attached "Request for Application Forms".
- April 6-13, 1967—notification of selection of participants and alternates.
- April 22, 1967—postmark deadline for acceptance of position as participant or alternate.
- June 18, 1967—latest date for arrival at San Jose State College for participation in institute.

Excellent library facilities are readily available to all students.

STIPENDS Participants will be eligible to receive, upon application, stipends of $75 per week, plus an allowance of $15 per week for each dependent during the six week period of the institute. Stipends will be paid on the following schedule: four weeks of stipend allowance on June 23, remaining two weeks on July 28. There will be no tuition or laboratory fee charged to participants.

Travel to San Jose State is at the participants own expense. Cost of room, board, and incidental expenses will be paid by the participants. No costs or expenses will be deducted from stipends.

HOUSING Dormitory housing will be available for single and married participants, including older children (over 10 years), in Washburn Hall. This dormitory is six years old, air conditioned, modestly furnished, clean and well maintained. Young children are discouraged since there are no recreational facilities for them in the dormitories.

Dormitory rates per person for Six Weeks Institute

Single occupancy	$72.00
Double occupancy	$60.00 each

Meals may be purchased from the college cafeteria. Cost depends on purchase and normally averages $3.00 per person per day. Blankets and towels are available at a cost of $1.00 per week.

For families with young children and others desiring private bath and cooking facilities, private apartments close to campus are available. Tentative arrangements have been made with Killian Enterprises to provide furnished two and three bedroom apartments at Lynn Hall, just one block south of campus. These apartments are modestly furnished and residents will be given swimming pool privileges at a neighboring Hall.

Private Apartments Rates For Six Week Institute

Two bedroom	$165.00
Three bedroom	$195.00

A cleaning and security deposit of $20 per person (maximum $80) will be charged. Refunds will be based on condition of apartment and returned after departure. Since

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REQUEST FOR APPLICATION FORMS
NDEA INSTITUTE FOR ADVANCED STUDY IN INDUSTRIAL ARTS
INDUSTRIAL MATERIALS - SAN JOSE STATE COLLEGE

Name .... Home Phone ....

Address .... Zip ....

.... Zip ....

School Name and Address .... Zip ....

.... Zip ....

Teaching Area .... Position or Title ....

Return this request to:

Ralph C. Bohn, *Director*
NDEA Institute for Advanced Study in Industrial Arts
San Jose State College
San Jose, California 95114

Application forms will be forwarded to you upon receipt of this request form. All application forms, letters of recommendation and transcripts must be postmarked by March 20, 1967.

this is a private company, the college and departmental responsibility to the participant can only be to *advise* and *assist* with housing arrangements. There is no connection between the college and *any* private housing company.

Industrial materials require constant supervision.

INFORMATION OF INTEREST The college summer Festival of Arts and other campus cultural and recreational activities will be available to participants and families.

San Jose is located in an excellent recreational area. The college is 30 miles from the Pacific Ocean, 20 miles from mountains and camping facilities, and 50 miles from San Francisco. The summer climate is dry with moderate temperatures! Evenings are very cool.

Ralph C. Bohn, *Director*
NDEA Institute for Advanced Study in Industrial Arts
San Jose State College
San Jose, California 95114

APPENDIX B

Copy of letter accompanying the application packet

Dear

Thank you for your interest in the NDEA Institute for Advanced Study in Industrial Arts at San Jose State College. This application packet contains the necessary forms and instructions for completing your application.

In order to apply, please do the following:

1. Have a transcript forwarded by the college or university that granted your Bachelor's and/or Master's degree with a major in industrial arts. Since this institute has a college chemistry requirement, the transcript should show these courses, or the equivalent described in Item 29 of the Supplement to the Application for Admission form. Have the transcript forwarded directly to me.

2. Complete the Application for Admission (Form OE 4401) with the attached San Jose State Supplement, and the Applicant Record Card (Form OE 4402). These should be mailed in one of the return envelopes provided.

All transcripts and forms must be completed and postmarked by March 20, 1967.

For your convenience, a copy of the institute brochure has been included. Page 2 contains all eligibility requirements as well as submission and notification deadlines.

Sincerely,

Ralph C. Bohn
Director

Enclosures:
1. Application for Admission (OE 4401) with San Jose State Supplement
2. Applicant Record Card (OE 4402)
3. Confidential Evaluation Form (OE 4403)
4. Two return envelopes
5. Institute Brochure

APPENDIX C

Copy of Special Supplement to Institute Application. (Since the application is a standard government form, a copy was not included in the appendices.)

APPLICATION FOR ADMISSION

(San Jose State Supplement)

29. Have you successfully completed one year of college chemistry?

_____ yes _____ no

If no, please indicate experience or nature and type of self study you have completed in lieu of college chemistry. Please indicate when your experience or self study took place.

30. In the space below, briefly describe your interest in attending this institute and studying industrial materials. Please include how this study will help your present teaching or supervisory position, and the use you hope to make of this instruction.

APPENDIX D

Copy of letter sent to each applicant who didn't have his application completed by one week prior to the deadline.

Dear

We have checked our files and find that your application for the NDEA Title XI Institute in Industrial Arts at San Jose State College is not complete.

The checked items listed below were missing at the time this letter was sent. It is possible that this letter and the item checked passed in the mail. We wanted to take this means of letting you know that the checked items were not on hand so that you might make the necessary follow-up.

________ Form OE 4403 - Confidential Evaluation Form. To be filled out by your industrial arts supervisor or school principal. An additional copy is enclosed.

________ Form OE 4402 - Applicant Record Card. An additional card is enclosed.

________ Transcript showing your Industrial Arts Degree and Chemistry, if completed in college.

________ Form OE 4401 - Application for Admission. We have received some materials for you but not an application form. If you are interested in applying, please complete the enclosed application form and any other materials checked on this letter.

If you are not interested in completing you application for the Institute, or if we receive some materials for you in error, it is not necessary to reply to this letter. If you wish any materials returned to you, please let me know.

All application material, including transcript, must be postmarked by March 20, 1967. This is a U.S. Office of Education regulation for NDEA Title XI Institutes. Your cooperation is appreciated.

Sincerely yours,

Ralph C. Bohn
Director

APPENDIX E

Copy of Identification Slip attached to each Application to aid Identification.

STATE ______________________________

CITY ______________________________

TEACHING LEVEL:

______ JUNIOR HIGH

______ SENIOR HIGH

______ TEACHER EDUCATOR

______ SUPERVISOR

______ OTHER (list)

____

SUBJECT AREA CURRENTLY TEACHING:

______ METALS

______ WOOD

______ AUTO

______ ELECTRICITY

______ GRAPHIC ARTS

______ DRAWING

______ GENERAL SHOP

______ OTHER (list)

____

APPENDIX F

Copy of letter to the Applicants Selected to attend the Institute

April 8, 1967

Dear

It is a pleasure to inform you that our NDEA Evaluation Committee has selected you as a participant in the NDEA Title XI Institute for Advanced Study in Industrial Arts to be held at San Jose State College from June 19 to July 28, 1967. You are one of 24 junior high teachers, senior high teachers, teacher educators, and supervisors selected from over 300 applicants. It is our belief that you will be an asset to the program and profit from the instruction and professional exchange of knowledge and ideas.

We hope that you will be able to accept this invitation. Acceptance will obligate you to devote your full efforts to the work of the Institute. Classes will be conducted from 8:00 a.m. to 4:00 p.m., Monday through Friday during the six week period. Outside reading and study will be a necessary part of the program. Consequently, you will not have time to carry on outside work or take other courses. If you accept and attend, you will be eligible to receive a stipend of $75/week plus $15/week for each dependent. We will expect you to arrive at the College no later than Sunday, June 18, 1967.

If you plan to accept appointment as a participant in this institute, the following three items must be completed and mailed no later than April 22, 1967:

1. Certificate of Acceptance
2. Oath or Affirmation Form (OE - 4101) completed and duly notarized
3. Application for Stipend Form (OE - 4404).

These three items are enclosed and should be completed and returned using the enclosed envelope. Unless these instructions are followed precisely, your name will be dropped automatically from the list of institute enrollees on the morning of April 26, 1967, and a replacement selected from the waiting list of alternate candidates.

Housing information will be forwarded to you after receipt of your acceptance. It will not be necessary for you to live on campus. However, commuting distances of more than 15 miles will require prior approval of the Institute Director. Individual and family housing will be available on campus at either campus dormatories or private apartments.

We look forward to having you join us on this cooperative experience in the study of Industrial Materials.

Sincerely,

APPENDIX G

Copy of Letter to Applicants Selected

Copy of letter to Applicants Selected as Alternates

April 8, 1967

Dear

Our Evaluation Committee for selecting participants for the NDEA Institute in Industrial Arts at San Jose State College has selected you as an alternate participant. You are among twenty-four alternates whom we are asking to stand by in the event any of the selected twenty-four participants decline the invitation to attend the Institute. Since application to more than one NDEA Institute was permitted, we expect a number of those selected will be unable to participate in our program.

Selected participants have until April 22, 1967 to officially accept the invitation. On or after April 26, we will select alternates to replace those unable to attend.

We received over 300 applications for the Institute and selecting twenty-four participants from the large number of eligible applicants was extremely difficult.

Best wishes for continued success in industrial arts teaching.

Sincerely,

Ralph C. Bohn, Director
NDEA Institute in Industrial Arts

APPENDIX H

Copy of letter to Applicants Not Accepted

April 8, 1967

Dear

Thank you for your interest in the NDEA Institute for Advanced Study in Industrial Arts which will be held at San Jose State College during the coming summer. It is with regret that we inform you that you were not one of those selected to participate.

We received over 300 applications from industrial arts teachers from all parts of the United States. The selection of 24 participants was very difficult since nearly all applicants were well qualified and able to profit from the planned program.

We sincerely hope you will find other means to enrich your professional preparation in industrial arts during the coming summer. San Jose State College offers a regular summer session graduate program in industrial arts. If you are interested in receiving further information about this program, please write.

Best wishes for continued success in industrial arts teaching.

Sincerely,

Ralph C. Bohn
Director

APPENDIX I

List of Participants, their teaching areas, home addresses, and school addresses.

NAME	SCHOOL ADDRESS	AREA
Keith C. Birks Box 184 Springfield, South Dakota 57062	Southern State College Springfield, South Dakota	Teacher Educator Electricity
David C. Bockman 4646 N. Arthur Fresno, California 93726	Fresno State College Industrial Arts & Technology Fresno, California	Teacher Educator Metals
Russell V. Cropley 2358 Arguello Place Santa Clara, California	Henry M. Gunn Sr. H.S. Palo Alto, California	Senior High Drawing
Hurthle L. Currie 2104 Fluker Street Pine Bluff, Arkansas 71601	A. M. & N. College North Cedar Street Pine Bluff, Arkansas	Supervisor Electricity
Frank Demchuck Route 1 Box 506E North Bend, Washington 98045	Mount Si High School Snoqualmie, Washington	Senior High Auto
Weldon R. Griffith 9111 Freeport Drive Dallas, Texas 75228	Dallas Independent Sch. Dist. 3700 Rosa Avenue Dallas, Texas	Supervisor Metals
Gerald R. Hansen 14291 Elva Avenue Saratoga, California 95070	Saratoga High School Saratoga, California	Senior High Drawing
Louis Horvath 95 Old Stage Road Old Bridge, New Jersey	East Brunswick H.S. Cranbury Road East Brunswick, New Jersey	Senior High Drawing
Charles W. Hoskins 822 Gilman Wichita, Kansas 67203	Mayberry Junior High 207 S. Sheridan Wichita, Kansas	Senior High Electricity
Everett B. Johnson 5009 Ivanhoe Avenue Baltimore, Maryland 21212	Southern High School Warren & Battery Aves. Baltimore, Maryland	Senior High Graphic Arts
Mark J. Jones 2201 Laurel Lane Visalia, California 93277	Tulare County Dept. of Ed. 202 County Civic Center Visalia, California	Supervisor Graphic Arts

Marlow F. Keith 117 E. 14 Street Tempe, Arizona 85281	Arizona State University Tempe, Arizona	Teacher Educator Wood
Donald H. Mankamyer 580 C North Palaheo Avenue Kailua, Oahu, Hawaii 96734	Kalaheo Hillside Inter.Sch. 730 Iliania Street Kailua, Hawaii	Junior High Metals
Robert D. Nesbitt 9706 Claremont N.E. Albuquerque, New Mexico 87112	University of New Mexico College of Education Albuquerque, New Mexico	Teacher Educator Auto
Lewis A. Oetinger 812 Aurora Avenue San Jose, California 95129	Fremont High School Box F Sunnyvale, California	Senior High Metals
Wendell J. Petersen 1305 East 200 South Sandy, Utah 84070	Butler Junior High School 7530 South 2700 East Salt Lake City, Utah	Junior High Drawing
Thomas J. Powers 22105 Linda Vista Place Cupertino, California 95014	Fremont High School Box F Sunnyvale, California	Senior High Auto
James W. Raybourn 1171 Lucille Street Livermore, California 94550	Livermore High School 600 Maple Street Livermore, California	Senior High Wood
Kenneth I. Rushing 6773 East Baker Place Denver, Colorado 80222	Manual High School 1700 East 28th Avenue Denver, Colorado 80205	Senior High Auto
William F. Schneider 3106 S. 69th East Ave. Tulsa, Oklahoma 74145	Hamilton Junior High School 2316 N. Norwood Place Tulsa, Oklahoma	Junior High Graphic Arts
John P. Sellarole 4107 Casa Grande Way San Jose, California 95118	William C. Overfelt H.S. 1835 Cunningham Avenue San Jose, California	Senior High Wood
Herbert J. Spring 575 Simpson Plymouth, Michigan 48170	Plymouth Junior High-East 1042 South Mill Street Plymouth, Michigan	Junior High Electricity
Joseph A. Tallerico 5641 Bonniemae Way Sacramento, California 95824	Will C. Wood Junior High 6201 Lemon Hill Avenue Sacramento, California	Junior High Metals
Boyd R. Whitt 342 Marengo Road Harvard, Illinois 60033	Harvard Junior High School Harvard, Illinois	Junior High Graphic Arts

APPENDIX J

Copy of Follow-up letter to Alternates prior to start of the Summer Session.

May 25, 1967

Dear Industrial Arts Teacher:

At the present time, the 24 participants in the NDEA Title XI Institute in Industrial Arts at San Jose State College have been selected and have accepted. As a result, we do not anticipate having any additional positions available for the present institute.

Naturally, it is possible that due to a change of assignment or for personal reasons, someone now planning on attending the institute might have to drop out. In this case, we would return to our alternate list and contact people by telephone to determine whether they could attend. We do not, however, feel that you should plan on this procedure and that you should feel free in making personal plans for the coming summer.

Sincerely,

Ralph C. Bohn
Director

APPENDIX K

Copy of Housing Letter Sent to All Participants

May 3, 1967

Dear NDEA Institute Participant:

Our class of 24 is now complete and a listing of participants with addresses will be sent to each of you in the near future. This memo contains the housing information which many of you need.

1. Residence Hall Housing at San Jose State College - These residence halls are owned and under the supervision of the State College. As mentioned in the brochure, the residence halls are air-conditioned but have no facilities for cooking or private baths. They are only a few years old and might be best described as "typical college dormitories." All meals must be taken in the college cafeteria, where the cost will run between $3 to $4 per day. The residence halls do not require a security deposit. Children are welcome but all assignments will be made on a basis of one or two persons per room. From past experience, the college has found that children under ten years of age find the residence halls somewhat confining, since there are no play areas or activities suitable for the young. If you have small children, we recommend one of the apartments listed below. Single people and married couples find the residence halls adequate for their needs, provided they are willing to take all meals out and share bath facilities.

   An application form for the residence hall is enclosed.

2. Killion Enterprises Apartments - These are privately owned apartments close to campus (within reasonable walking distance of the industrial arts department). The college has no family residence halls or apartments. As a result, many private apartments have been built to serve married students and families. (Families are permitted to live in the residence halls only during the summer.) The Killion Apartments fall into this category.

   A sheet containing descriptive information and application procedures is enclosed. Please note that a deposit is required.

3. Woodland Apartments - The following description was received from the owner: Three rooms, clean, quiet, comfortable. One-half block from campus. Choice of double bed or twin beds. One child ok. Six weeks rent is $125 (includes utilities), carport $4 extra. A $50 security deposit is required. Our secretary visited these apartments and she indicated they were adequate--clean, but not very large.

An application form is not possible. Please write directly or phone the owner listed at the following address:

Mr. R. McClintic
1330 Mariposa
San Jose, California 95126

Phone: 408-377-7305

4. A faculty member has a house available for the summer and would be interested in renting it to a member of the institute. The house consists of three bedroom, all furnishings, on a quarter acre lot. It is located in southwest San Jose, about eight miles from the college (easy commuting distance).

   Interested parties should contact Mr. Donald Betando at 408-377-3947 or by writing to him at the Industrial Arts Department at San Jose State College.

5. Mr. Charles Slater, industrial arts teacher, Del Mar High School, will be attending an NDEA Institute in Arizona this summer and will have his home available. Home is furnished, three bedrooms, two baths, with separate family room and close to the College.

   Interested parties should contact Mr. Slater at 408-297-4033 or at school 408-298-0260.

Please give special attention to the size and amount of the deposit required at each of the apartment units. Each company makes an honest effort to maintain their apartments and they are quite strict in their evaluation. Deposit funds provide the resources needed to repair and maintain the units. Damage, such as marked walls, even though unintentional, is chargeable.

Evaluation of your apartment will be made after you leave San Jose and your refund, if any, will be mailed to you. From past experience with one of these units plus other apartments throughout the country, full return of your deposit should not be expected. At last year's institute, the returns varied from none to full. We suggest you anticipate none, adding the deposit to your rented fee to determine your cost for housing. Any return then becomes an unexpected dividend.

In addition to the places listed, there are a number of mobile home sites in the area. There are no camping facilities within commuting distance of the College. If you plan on bringing a mobile home, we suggest you contact the National Directories on mobile home parks. We will be glad to advise you regarding location and give you any help that we can.

Each family or individual should contact campus housing, the apartment units, or the listed individuals, and make his own arrangements for housing. We will be glad to assist and help, but must emphasize that you should make individual arrangements and be individually responsible for housing. We will make all stipend payments directly to you and you may then in turn pay for your own housing and other expenses.

As time goes on, we will be forwarding more information regarding our geographical area and the program of the institute. In the meantime, we have enclosed a sheet for questions. If you have questions, please jot them down on the sheet and return them to us in the enclosed envelope. We will bring all of the questions together and prepare a duplicated release so that all may profit from the specific questions that each of you might have. (We won't identify the source of the question.)

A closing note--we have had a number of weeks of rain, but today is a beautiful spring day. During last year's institute, the average daytime high was in the low 80's and night-time low in the high 50's. The sun shined every day. We hope we will have the same weather this year.

Sincerely,

Ralph C. Bohn
Director

APPENDIX L

Copy of Stipend and General Information Letter Sent to All Participants

May 17, 1967

Dear

As the time for the NDEA Summer Institute draws near, we would like to provide you with some additional information which will help you plan your summer attendance at San Jose State College. Also, we would like to know how you are progressing on making arrangements for housing.

First - housing. On the enclosed sheet, please list your housing and travel plans. We realize your travel plans may not be finalized, but are interested in knowing your approximate arrival time.

On Sunday, June 18, 1967, you and your family are invited to attend an "Informal Barbeque" from 4:30 to 8:30 p.m. at my home. Please dress casually and come and get acquainted with the institute staff and other members of the institute. There will be no planned activities and a simple hamburger barbeque will be served between 5:00 and 6:30 p.m. We realize many of you will be just arriving and will want to get settled-- so we will anticipate a few "eat and we have to hurry home to unpack..." A map showing directions to my home is included.

I'm sure you have questions regarding payment of stipends. Your stipends will be paid at the rate of $75 per week for the educator in attendance plus $15 for each dependent. We are permitted to pay part of the stipend in advance and plan two payment dates. Three weeks of your allowance will be paid on Friday, June 23, and the remaining three weeks on Friday, July 28. From our records, we have calculated your total payment as follows:

Number of dependents = ________

Payment, Friday, June 23 = $________

Payment, Friday, July 28 = $________

TOTAL STIPEND = $________

If, for some reason, you leave the institute prior to its completion, you will receive a pro-rated stipend. If you leave after receiving the initial stipend, but before the first three weeks are completed, you will have to repay a pro-rated amount.

All stipends will be payed to you by check. No deductions will be made. As a result, you will be responsible for paying for your own housing and other living expenses.

Also, please anticipate between $20 and $30 for books which will be needed for the Institute. A list of these will be provided with other instructional materials so that you can bring them with you--if you now have them available.

We have included some brochures that may be of interest to you and make your stay more pleasant. We are looking for additional material, and will send it under separate cover as it arrives. Also, we will send the promised "Question and Answer" report based on your questions as soon as all replies are received.

The two principle faculty members - Professor Louie Melo and Professor Leslie Stephenson are preparing instructional outlines and other information for your review. These will be forwarded under separate cover as they are completed. Regarding instruction, if you are interested in doing a little homework before coming, may I suggest the following:

a. Review a basic textbook on organic and inorganic chemistry. We are not conducting a chemistry institute--but we are interested in providing instruction on "Understanding materials, their properties, their changes, and why they occur." This understanding requires a knowledge of the structure of both organic and inorganic matter.

b. Review a few industrial arts technical books (the ones you and other faculty members at your school use), giving special attention to the information provided on the structure and properties of materials.

c. If you have the textbook "Elements of Materials Science" by Van Vleck, Addison-Wesley Publishing Co., please review it. This book contains a lot of calculations - please ignore them. It is the best book available but contains information we will not use, such as the mathematical calculations.

May I suggest that you look over the outline and information sheet and review the suggested readings. In addition, bring with you books that may be of help to you. Don't let the difficulty of the book disturb you. Only those parts of value to our students will be studied.

Six weeks is a short period of time to learn about the properties, use, and selection of industrial materials--as well as developing procedures and teaching devices for providing instruction on industrial materials at the junior and senior high school level. As a result, we have planned a busy schedule involving a full day - each day. The daily schedule, subject to variation, is listed below:

8:00 - 9:30	Lecture and discussion - properties, use and selection of materials - L. Melo
9:30 - 9:45	Break
9:45 - 11:30	Laboratory activities - materials.
11:30 - 12:30	Lunch
12:30 - 2:00	Discussion and seminar - development of teaching procedures and devices - L. Stephenson.
2:00 - 2:15	Break
2:15 - 4:00	Laboratory activities - teaching devices.

The college will not be in session on July 4, but will be in session on July 3.

We suggest you plan a vacation after the Institute. The weekends will be excellent for short trips within the San Francisco Bay Area. Trips to Los Angeles, Yosemite, Lake Tahoe, etc. are too far for a weekend, and we recommend that you not try any extended trips of this type during the Institute.

We are looking forward to having you join us.

Sincerely,

Ralph C. Bohn
Director

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APPENDIX M

Copy of Question and Answer Report Sent to all Participants

May 29, 1967

MEMORANDUM

TO : Industrial Arts Teachers

FROM : Ralph C. Bohn, Director

SUBJECT: Question and Answer Report

Many of you took the liberty of asking one or more questions regarding the Summer Institute and your attendance at the college. We will try to answer all of your questions with this memo.

1. What procedure should be taken to obtain six units of credit for the Institute?

   On the first day of the Institute, registration packets will be distributed to everyone in attendance. We assume that everyone will want six units of credit for the institute and will have each person fill out the packet so that they will receive this credit. If anyone wishes to attend the program without credit, we will make special arrangements and register them as "audits". This type of registration will in no way effect their program, but will permit them to attend and participate in every way, but without credit.

   There will be no additional requirements placed on students seeking credit versus those not seeking credit--nor will differentiation be made between graduate and non-graduate. There will be some examinations, but in general, we plan on conducting the program as a cooperative effort between our faculty and those in attendance. We are expecting a great deal of work for all (faculty and participating teachers) and we are hoping the benefit will be worth the effort expended.

2. Will the course assignments be reasonalbe, without too many written term papers or homework assignments?

   There will be no term paper. However, there will be some homework assignments which will involve reading, study, and preparation of short reports which will be presented to the total class. Essentially, the homework will cover two areas:

   1. A study of industrial materials, their properties, uses, selection, etc. (text and reference books).

2. Self accepted responsibilities resulting from group activity within the institute. This will include things your group wants to do, such as, planning particular devices to teach, for example, holding qualities or adhesives. This example might include the development of plans for a teaching device, and the fabrication and testing of this device. More information will be provided starting June 19.

3. May I arrive at the Institute one day late due to school closing and travel time?

   The Institute will start with a full day on June 19, and anyone absent on that day without having notified us will be automatically replaced by an alternate. (Naturally, we will make every effort to find out what happened, but we don't want to leave a spot empty that could be filled by a teacher.) We hope that everyone will be present on that day and that school districts which close on the 16th might provide some special consideration for their faculty members. Monday, June 19, will be a full day and missing it will result in a difficult start for the individual. Also, we are required by law, that stipends cannot be started until the person physically arrives at the institute. Therefore, if someone misses at the beginning, it would result in a $15 reduction in the person's stipend, plus a $3 reduction in each dependent's stipend for each day missed (sickness during the institute will not result in a loss of stipend support). This same condition prevails if a person leaves early.

4. Will the stipends arrive promptly while at San Jose?

   We anticipate no difficulty in providing stipends as listed in our last letter to you.

5. Will all reference material be available at the institute library?

   The institute library will be used only by the students in the Institute. However, most books are single copies. As a result, each member is asked to bring his own copy (or purchase a copy from the bookstore). Also, please bring any reference books mentioned in Mr. Melo's course materials recently sent to you.

   The general library holdings are very extensive and will be available to the Institute. Naturally, general library holdings will be shared with other students on campus.

6. Are there special clothes necessary for the Institute or the San Jose climate?

   We recommend that you bring a shop apron or shop coat for laboratory activities. One of the instructors normally uses a rubberized apron while the other uses a shop coat. The laboratories are clean and well maintained, but certain materials and chemicals can cause damage to clothing.

The San Jose climate is mild with days normally being in the mid or low 80's. We do get some warm weather and the temperature could, on occasions, rise to the high 90's, with low humidity. Evenings are often cool and it is very common to put on a sweater around 7:00 or 8:00 p.m. We, therefore, recommend that you bring normal summer clothes plus a sweater or very light jacket for cool evenings or trips to the mountainous areas of the State.

7. Will there be provisions or housing available for families which might come for just the last week in July?

Residence Halls will be on a first come, first serve basis with preference given to residence for the full six weeks. We have been assured that everyone applying before mid June will be taken care of in the resident halls. If there is space available in July, arrangements could be made for the family. However, no guarantee is possible, since the residence halls may be filled with students. It is possible, however, to rent a motel unit in the area for one week. There are many available at various prices and corresponding degrees of luxury.

8. Are there trailer courts or mobile home courts available in the vicinity, and what are their procedures for accepting reservations?

During the past week, Mrs. Sharleen Taylor, Institute Secretary, visited a number of the mobile home courts fairly close to campus.

The following information is provided on a court-to-court basis for your guidance. Basically, our local area is plagued by an abundance of mobile homes and a shortage of space. As a result, we suggest you give serious consideration to the campus housing suggested in previous correspondence. The following parks are within easy commuting distance:

Mayfair Trailer Park
1840 So. 7th Street
San Jose, 95112

Contact: Mr. Obie Goss
Phone : 408-294-1707

Rates: $15 per week (includes utilities) for one or two persons.
$1 more for each person thereafter.
Dogs are the only pets allowed - $1 extra.
The park has laundry facilities, no pool, closest part to campus.
Mayfair Trailer Park is the only court in this area that will accept reservations in advance--one week before the Institute.....

Pepper Tree Estates
2150 So. 1st Street
San Jose

Contact: Mrs. Mercer
Phone : 408-292-7042

Rates: $15 per week (includes utilities)
Laundry facilities and heated pool.
If they have a space, they will accept a reservation from 100 miles away.
No pets....

Trailer Terrace	
3010 S. 1st Street	Contact: Mr. Ken Downing
San Jose, 95111	Phone : 408-227-8560 or 408-227-9990

Rates: $12.50 per week (includes utilities)
Adults only, no pets.
Laundry facilties, no pool.
Trailer Terrace will not accept reservations in advance--
strictly first come, first serve basis....

9. Please provide clarification on the pro-rated pre-payment of stipends mentioned in a recent letter.

   In our letter of May 17, 1967, we mentioned that if a student attended the Institute and received a stipend and then left, he would have to re-pay the unused portion of the stipend. This could occur since the first stipend payment of three weeks will be made at the end of the first week. An example may clarify this question.

   On Friday, June 23, Mr. X, who is single, receives his stipend payment of $225 ($75 per week for the first three weeks of the Institute). On June 28, major personal problems develop and he leaves the institute permanently. Mr. X would be entitled to one week plus three days stipends, a pro-rated amount of $120. Since he had already received $225, he would be asked to repay $105. We do not expect anything of this type to happen, however, it has happened at institutes in previous years. As a result, government regulations have been established to cover the possibility. By the way, if a new dependent joins your family during the institute, there are provisions for obtaining a stipend for the new arrival.

10. Please send a list of special reference books required for the course.

    This list was recently mailed. If further information is needed, please let us know.

11. Would you suggest that we bring a typewritter along?

    Yes.

12. Does the college have a swimming pool available for dependents? What other recreational facilities are available?

    Activities available on campus will include Wednesday night movies, daily swimming and recreation activities, Bridge lessons, Golf Tournament, Steak Barbecue, Folk, Square and Balkan Dancing, Bonfire sing, etc. The hours for most of these activities have not been established, but will be before you arrive. Swimming for example, will be on a schedule basis since the pools are also used for classes during the summer session. Two special activities requiring prior reservations have been planned for the summer.

These are:

1. Yosemite Trip on the weekend of July 15 and 16. Overnight tent camp reservations at Yosemite for the night of Saturday, July 15 have been made for the following number of people from campus:

   30 doubles - $2.75 per person plus 4% tax
   15 triples - $2.50 per person plus 4% tax
   18 quads - $2.25 per person plus 4% tax

   In order to accomodate members of our institute that are interested in attending, Mr. Syd Lee, who will be assisting Mr. Melo with instructions, will serve as Coordinator of this trip for our Institute members wishing to attend. If you are interested in attending, please drop a note to him (same address as mine) indicating how many will be coming and which reservations you wish. Transportation will be by individual. However, we can work up car pools within our Institute.

2. Baseball Trip - SF Giants vs Los Angeles, on Sunday, July 9, and SF Giants vs Pittsburgh on Saturday, July 29 (these tickets are limited and will be on sale at Student Affairs Business Office after summer school starts - $4.75 includes bus transportation and a choice reserved seat ticket).

   We also plan on having a department barbecue and golf tournament plus other activities that the institute families might want to plan together. All recreation and activity type programs are optional, so don't feel that a heavy program is being planned for you. At the same time, we know that the institute pace is going to be fast and hope that dependents will take part in campus activities and not rely on their husbands to plan and share all of their recreation and leisure activities.

3. Are there any classes available in the area of crafts for wives?

   All wives are eligible to attend the summer session program which has a rather complete list of fine arts, industrial arts, (we are offering an excellent program in art metals, lapidary and jewelry, graphic arts, etc.) music, physical education, etc. Local schools also conduct summer sessions, and your family will be eligible to attend. We hope to send you information of the recreation programs available in the San Jose area. A Summer Session Catalog will follow under separate cover.

14. How strongly will the 15 mile maximum commute distance be enforced?

    This figure is a reasonable guide. We want to discuss greater commute distances to make sure the person is aware of traffic problems, etc. For example, there are camp areas in the surrounding mountains. Even though they are about 25-30 miles from campus, it is an impractical commute. This regulation was made to discourage commuting from camp sites and also from San Francisco and vicinity.

Enclosed find mailing list of participants who will be attending the Institute.

APPENDIX N

Typical unit prepared during the Institute. This is one of 60 developed, and included the building and testing of a demonstration model.

PRESENTED BY:
Frank Demchuck
Mount Si High School
Snoqualmie, Washington

TITLE: EXTREME PRESSURE LUBRICANT TESTER GRADE LEVEL - HIGH SCHOOL & COLLEGE

I. INTRODUCTION

Lubricants have many important functions in an automobile and other types of machinery. The study of lubricants involves the various desirable properties a lubricant must possess in order to accomplish its purpose. An interesting way to begin studying the desirable properties of lubricants is to make extreme pressure tests on various grades of engine oil and thus develop some general comparisons. This testing tends to generate interest in other properties of lubricants and how lubricants become almost totally functional.

II. MATERIALS AND EQUIPMENT

This tester (see enclosed drawings) can be made in a machine shop where a drill press and engine lathe are available. The following equipment is also needed:

-Torque wrench to apply controlled amounts of twisting force to the bolt which applies pressure onto the bearings block. A pound-inch type is preferred.

-A drill press to rotate the shaft.

-A supply of soft 1/4" drill rod test pins and 26 ga. black iron bearings.

-A timing device with a second hand for timing intervals at which increased load is applied.

III. UTILIZATION IN THE TEACHING-LEARNING ENVIRONMENT

A. SAFETY

1. Bolt or clamp the tester securely to the drill press table.
2. Carefully check alignment of test pin in relation to test pin holder to prevent off-center wobble.

B. PRESENTATION

Typical teacher demonstration or student experiment: Insert test pin and bearings into the tester and fill the recess around the test pin with the oil to be tested. Then tighten the bolt finger tight. Align the test pin carefully into the test pin holder which is mounted in a drill press. Clamp the tester to the drill press table. Set the drill press for a spindle speed of approximately 600 R.P.M.'s. First, run the tester for 30 seconds at no load then every 10 seconds increase the load by steps of 1 lb-ft. or 12 lb.-inches, by using a torque wrench to tighten the bolt. Have an assistant record the torque wrench readings and the torque indicated on the scale of the tester. Continue this procedure until the oil breaks down causing the test pin and bearing to seize which in turn break the test pin. Repeat this procedure with various types and rated oils. Also with special oil supplements or additives mixed with the oil in recommended porportions.

C. OBSERVATIONS AND CONCLUSIONS

1. QUESTIONS TO BE ANSWERED DURING THE EXPERIMENTS
    - a. How do oils rated by A.P.I. as *MS Service* compare with oils rated *MM* and *ML Service* in regard to load carrying capacity?
    - b. What effect do special oil supplements or additives have on the load carrying ability of lubricating oil?
    - c. What other important properties of oil need to be evaluated before a general evaluating comparison between oils can be made?
2. AREAS FOR FURTHER STUDY
    - a. How is viscosity related to load carrying capacity?
    - b. What types of additives are added to oil to increase load carrying capacity? Are there any disadvantages in use of these additives? Explain.
    - c. What causes a bearing to seize?

IV. DEFINITION OF TERMS

A. Viscosity (body and fluidity) - the tendency of an oil or liquid to resist flowing. May be divided into two areas: body - resistance to oil film puncture or penetration; fluidity - ease with which oil flows through oil lines ans spreads over bearing surfaces.

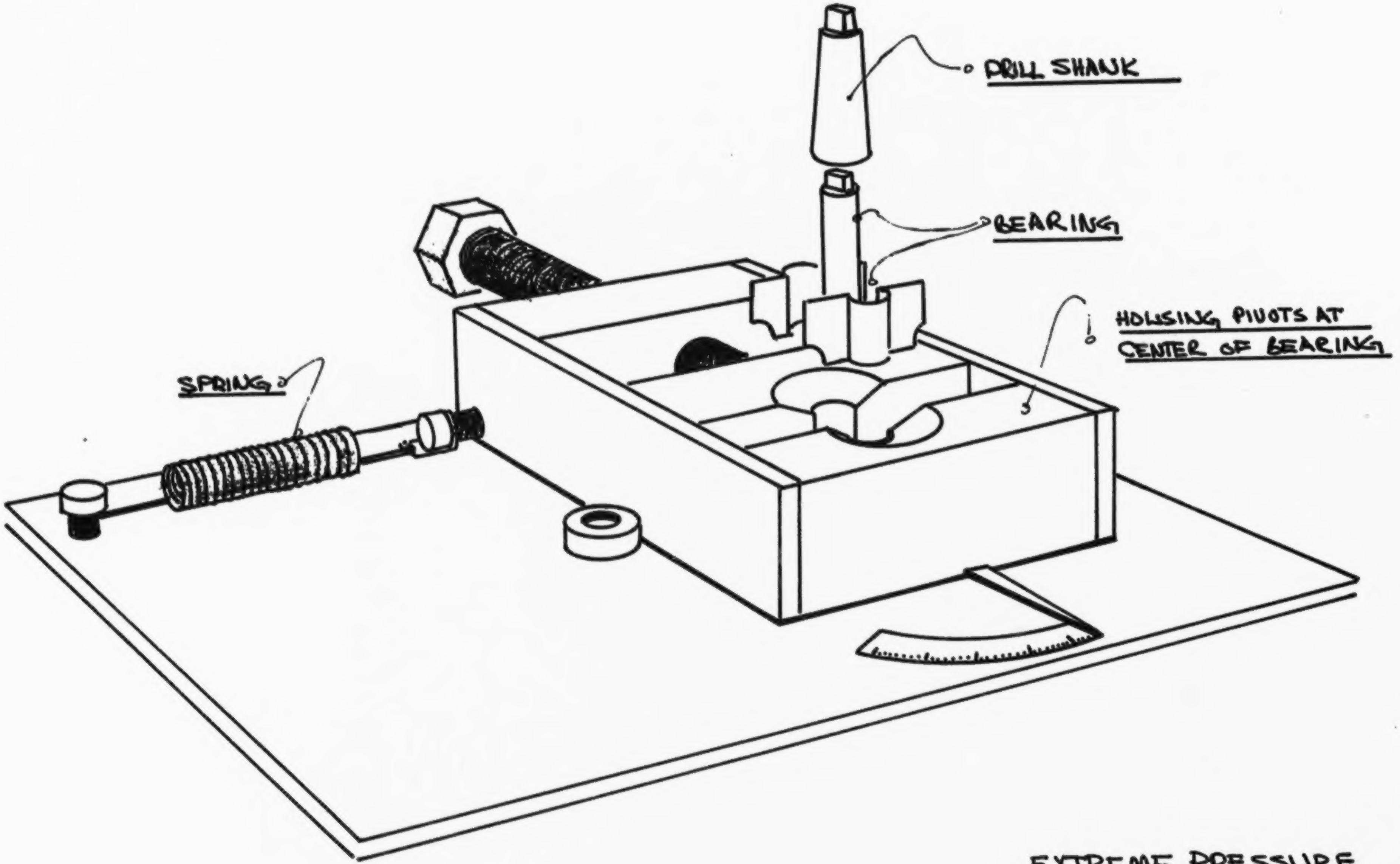
B. Extreme pressure resistance - ability of oil to remain on bearing surfaces to provide lubrication during extreme pressure loads.

V. REFERENCES

Almen Extreme Pressure Lubricant Tester K325. Koehler Co., Jamaica, N.Y. (mimeographed)

Crouse, William H., *Automotive Mechanics*, 5th ed., Webster Division, San Francisco: McGraw-Hill Book Co., 1965, Ch.11.

Popovitch, M., *Fuels and Lubricants*, New York: John Wiley and Sons, Inc., 1959, Ch. 10.


DRILL SHANK
BEARING
HOUSING PIVOTS AT
CENTER OF BEARING
SPRING

EXTREME PRESSURE
LUBRICANT TESTER
BY F. DEMCHUCK

APPENDIX O

Copy of Participant Evaluation Form. The regular form provided one page per question, permitting adequate space for comments. The writing space was eliminated in this Appendix.

To assist the staff in planning future institutes, please complete this questionnaire. Do not sign your name on this form. The completed form is due on Friday, July 28, 1967.

I. Strengths and Weaknesses - Morning Program

1.1 Which phase or part of the Morning Program was most valuable to you?

1.2 Which phase or part of the Morning Program was least valuable to you?

COMMENTS: To assist the Institute Staff, please write your additional comments below.

II. Strengths and Weaknesses - Afternoon Program

2.1 Which phase or part of the Afternoon Program was most valuable to you?

2.2 Which phase or part of the Afternoon Program was least valuable to you?

COMMENTS: To assist the Institute Staff, please write your additional comments below.

INSTRUCTIONS: In the boxes at the right, indicate the value of the following Institute areas to you.

III. Faculty Conducted Program	**Very Good**	**Good**	**Poo**
3.1 Morning Instruction Industrial Materials Content			
3.11 Lectures	( )	( )	(
3.12 Demonstrations	( )	( )	(
3.2 Afternoon Instruction Curriculum and Instructional Materials			
3.11 Seminar and Group Activities	( )	( )	(

	Very Good	Good	Poor
3.12 End Product and Usefulness of Group Activities	( )	(X)	( )
3.3 Pre and Post Test	( )	( )	( )
3.4 Homework Assignments	( )	( )	( )
3.5 Evaluation and Grading Procedures	( )	( )	( )

COMMENTS: To assist the Institute Staff, please write your additional comments below.

IV. Related Instructional Programs

4.1 3M Presentation	( )	( )	( )
4.2 Kodak Presentation	( )	( )	( )
4.3 Brodhead-Garrett Presentation	( )	( )	( )
4.4 Field Trips	( )	( )	( )
4.5 Guest Speaker - Underwriter	( )	( )	( )
4.6 Guest Speaker - Industry	( )	( )	( )

COMMENTS: To assist the Institute Staff, please write your additional comments below.

V. Institute Related Procedures

5.1 Overall organization of course schedule (schedule of activities)	( )	( )	( )
5.2 Institute Time Schedule - class hours and days	( )	( )	( )
5.3 Housing Arrangements and handling of Related Problems (living conditions)	( )	( )	( )
5.4 Social and Recreational Activities - Providing of Information	( )	( )	( )
5.5 Payment of Stipends - Schedule of handling procedures	( )	( )	( )
5.6 Communications and correspondence prior to Institute	( )	( )	( )

COMMENTS: To assist the Institute Staff, please write your additional comments below.

VI. **Institute Support Staff**

Services of:

	Very Good	Good	Poor
6.1 Director	( )	( )	( )
6.2 Teaching Assistants			
6.21 Industrial Materials (Morning)	( )	( )	( )
6.22 Instructional Materials (Afternoon)	( )	( )	( )
6.23 Design Assistants	( )	( )	( )
6.3 Secretarial Services	( )	( )	( )

COMMENTS: To assist the Institute Staff, please write your additional comments below.

VII. If the Institute were to be repeated next summer for another group, what specific changes would you recommend? Please explain why, as applicable.

VIII. As a result of your experiences in the Institute, what tentative changes do you hope to make in your program?

APPENDIX P

Statistical tables developed and furnished by the Measurement Research Center of Iowa.

MEASUREMENT RESEARCH CENTER
SELECTEE ROSTER

Line Number			Soc. Sec. Number	Final Status	For MRC Use Only
1	BIRKS	KEITH	851-21-265	X	0904 0001
2	BOCKMAN	DAVID	485-62-437	X	0904 0002
3	*CHASE	GRAHAM	471-41-133	Not Enrolled	0904 0003
4	CROPLEY	RUSSELL	563-84-108	X	0904 0004
5	CURRIE	HURTHLE	301-22-411	X	0904 0005
6	DEMCHUCK	FRANK	391-67-598	X	0904 0006
7	GRIFFITH	WELDON	602-28-886	X	0904 0007
8	HANSEN	GERALD	713-66-660	X	0904 0008
9	HORVATH	LOUIS	551-87-298	X	0904 0009
10	HOSKINS	CHARLES	451-25-122	X	0904 0010
11	JOHNSON	EVERETT	271-85-413	X	0904 0011
12	JONES	MARCELLUS	650-14-963	X	0904 0012
13	KEITH	MARLOW	260-93-116	X	0904 0013
14	NESBITT	ROBERT	593-00-086	X	0904 0014
15	OETINGER	LEWIS	543-62-474	X	0904 0015
16	PETERSEN	WENDELL	291-03-889	X	0904 0016
17	POWERS	THOMAS	474-20-074	X	0904 0017
18	RAYBOURN	JAMES	564-43-517	X	0904 0018
19	RUSHING	KENNETH	634-29-817	X	0904 0019
20	SCHNEIDER	WILLIAM	602-87-679	X	0904 0020
21	SELLAROLE	JOHN	735-07-759	X	0904 0021
22	SPRING	HERBERT	842-69-141	X	0904 0022
23	TALLERICO	JOSEPH	634-65-456	X	0904 0023
24	WHITT	BOYD	343-27-753	X	0904 0024

Number of participants listed on roster 24*
Number of new participants not listed on roster 1
Total number of participants actually enrolled. 24

*MANKAMYER DONALD 160-20-8900 X

*New Participant added when Mr. Chase declined...

APPENDIX Q

Statistical table developed and furnished by the Measurement Research Center of Iowa.

HEADER CARD

April 22, 1967

1. Total of applicant record cards submitted 251

   A. Number of selectees 24
   B. Number of non-selectees . . . 227

2. How many dependents were claimed by individuals designated as selectees?. 80

3. How many individuals designated as selectees are involved in the teaching (etc.) of special classes for handicapped children and youth? . . . 5

   Of these, how many are in schools which are:

   A. Primarily or exclusively for the handicapped? 0
   B. Only incidentally for the handicapped? . . . 5

4. A. Approximate number of inquiries from potential applicants 1609
   B. Number of application packets mailed out to potential applicants 563
   C. Number of completed applications returned . 251
   D. Of the completed applications returned, how many were from "first-rank" applicants? . . 215
   E. Number of applicants who were offered admission but declined. 3